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AMIGA WORLD

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2D Or Not 2D ?

Graphics '92

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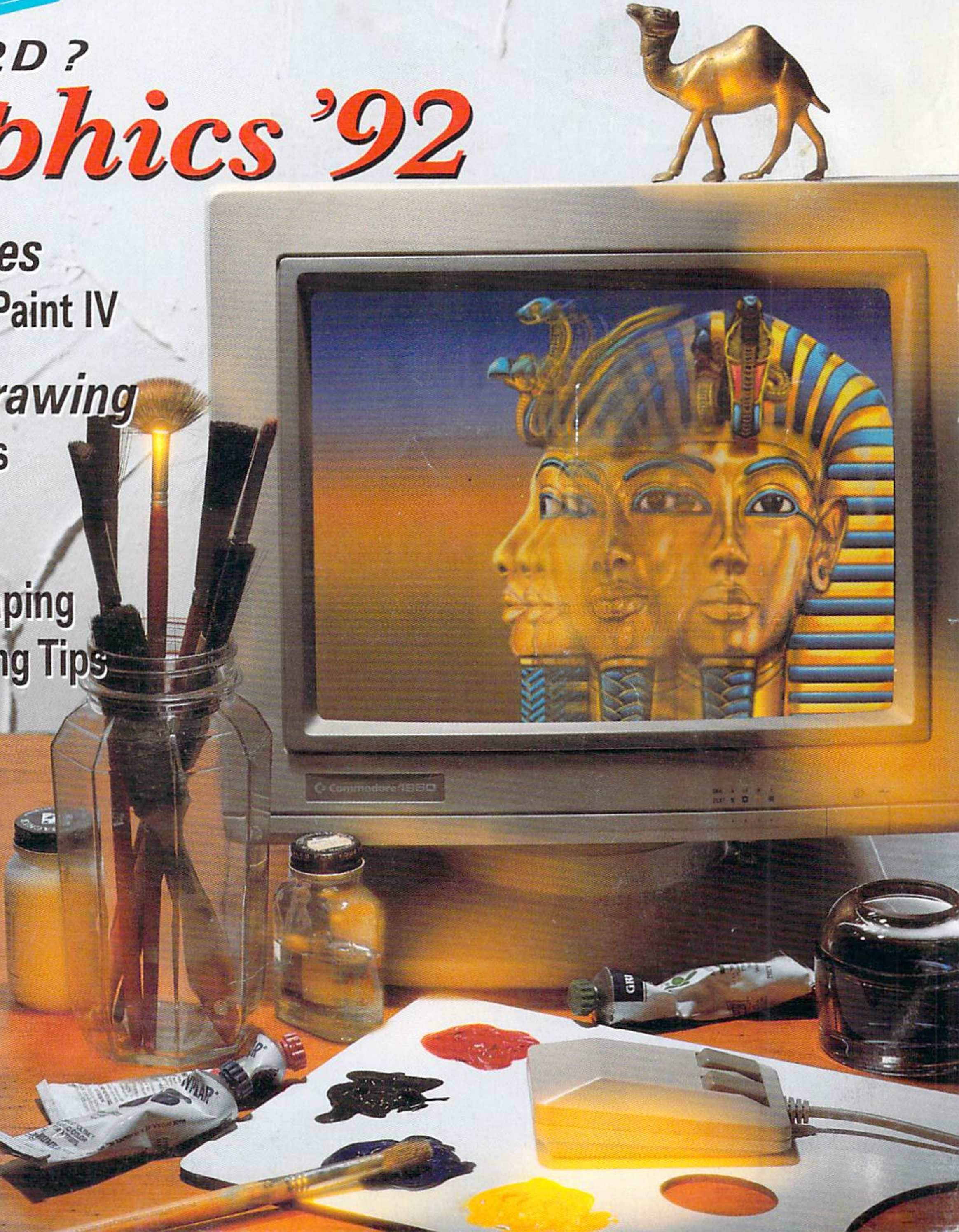
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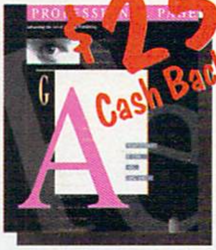
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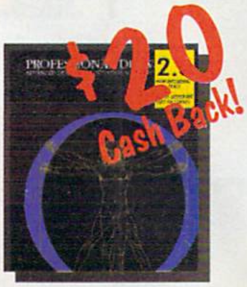
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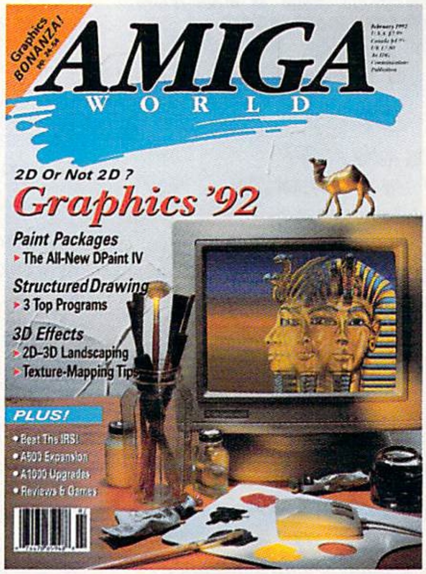
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C·O·N·T·E·N·T·S

FEATURES

ARTICLES



*It's a gala affair and **AmigaWorld** is hosting. Our **Graphics '92** February special showcases the new DPaint IV, Amiga structured-drawing programs, plus tutorials on painting, landscaping, and texture-mapping. Harness your creativity and join us!*

COLUMNS

DEPARTMENTS

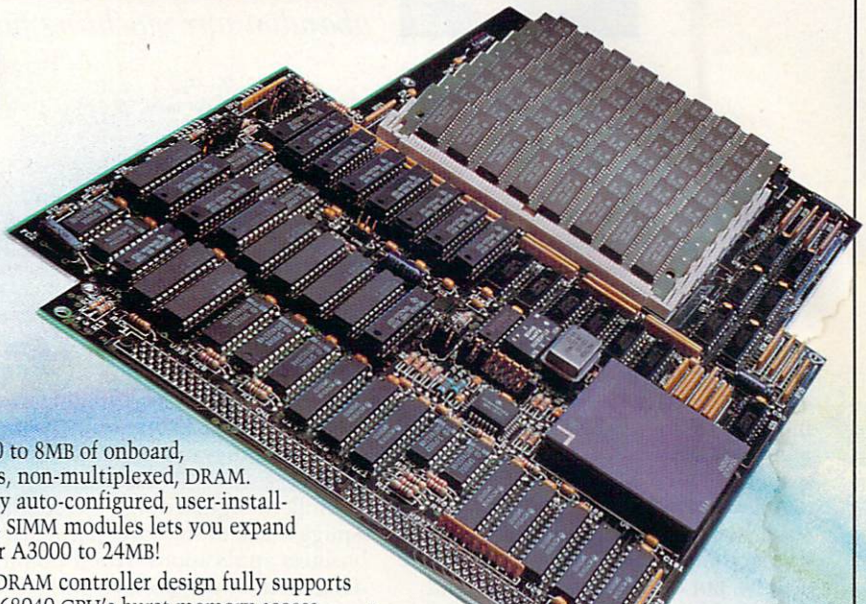
REVIEWS

GAMES

COVER PHOTOGRAPH BY ED JUDICE

THINK ALL '040 ACCELERATORS ARE THE SAME?

THINK AGAIN!



As a high power Amiga® 3000/3000T user you need a 68040 accelerator board for one reason ... and one reason only ... SPEED!

And once you know what makes one 68040 accelerator better than another, the only board you'll want is the **G-FORCE 040** from GVP.

WATCH OUT FOR SLOW DRAM BOTTLENECKS

Yes, all 68040 CPU's are created equal *but* this doesn't mean that all accelerator boards allow *your* A3000 to make the most of the 68040 CPU's incredible performance.

The A3000 was designed to work with low-cost, 80ns DRAM (memory) technology. As a result, anytime the '040 CPU accesses the A3000 motherboard, memory lots of CPU *wait-states* are introduced and all the reasons you bought your accelerator literally come to a screeching halt!

Not true for the **G-FORCE 040**...

SOLUTION: THE G-FORCE 040's FAST, 40ns, ON BOARD DRAM

To eliminate this memory access bottleneck, we designed a special 1MB, 32-bit wide, non-multiplexed, SIMM module using 40ns DRAMs (yes, *forty nanoseconds!*). This revolutionary memory module allows the **G–FORCE 040** to be populated with up to 8MB of state-of-the-art, high performance, on-board DRAM. Think of this as a giant 8MB cache which lets the '040 CPU race along at the top performance speeds you paid for.

SHOP SMART: COMPARE THESE G-FORCE 040 SPECS TO ANY OTHER '040 ACCELERATOR

▶ 68040 CPU running at 28Mhz providing 22 MIPS and 3.75 MFLOPS!
NOTE: The 68040 incorporates a CPU, MMU, FPU and separate 4KB data and instruction caches on a single chip.

▶ 0 to 8MB of onboard, 40ns, non-multiplexed, DRAM. Fully auto-configured, user-installable SIMM modules lets you expand your A3000 to 24MB!

▶ DRAM controller design fully supports the 68040 CPU's burst memory access mode.

▶ Full DMA (Direct Memory Access) to/from the on-board DRAM by any A3000 peripheral (e.g: the A3000's built-in hard disk controller).

▶ Asynchronous design allows the 68040 to run at clock speeds independent of the A3000 motherboard speed. Allows easy upgrade to 33Mhz 68040 (over 25.3 MIPS!) when available from Motorola.

▶ Hardware support for allowing V2.0 Kickstart ROM to be copied into and mirrored by the high performance on-board DRAM. Its like caching the entire operating system!

▶ Software switchable 68030 "fallback" mode for full backward compatibility with the A3000's native 68030 CPU.

▶ Incorporates GVP's proven quality, experience and leadership in Amiga accelerator products.

TRY A RAM DISK PERFORMANCE TEST AND SEE FOR YOURSELF HOW THE G-FORCE 040 OUT PERFORMS THE COMPETITION

Ask your dealer to run any "RAM disk" performance test and see the **G-FORCE 040**'s amazing powers in action.

So now that you know the facts, order your **G-FORCE 040** today. After all, the *only* reason why you need an '040 accelerator is ***SPEED***!

G-FORCE 040™



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CHIEF CONCERNS

Although thousands swear by their Amigas, those who abandon our machines have reasons and should be heard.

IN A SINGLE day, I received three letters that made me as nervous as a squirrel on a four-lane highway.

The first one was just signed "Wayne." It seems that last summer Wayne bought a cheap IBM clone and kissed his "terminally brain-dead" Amiga off for good. Wayne blames incompatibility, the lack of software, and poor service and support for his switch.

A few letters further down in the stack was one from Christoph L. Herd, who not only sold his A500 and bought a clone, but cancelled his *AmigaWorld* subscription. Say it ain't so, Christoph!

Herd is sick of gurus, tired of his quirky hard drive, fed up with the lack of response to requests for information (including three or four unanswered letters to us), and appalled at the lack of serious business software. He did have a comment about the Amiga's great authoring and video-titling products, saying, "Next time I need to title a movie, I'll be sure to buy myself another Amiga." While I always like good sarcasm, this line hits a little close.

Marlin Greene also wrote to complain about what he called the sorry state of Amiga software, and said his A3000 is a "$3000 game machine." According to Greene, many products do not work as advertised, and he accuses *AmigaWorld* of hiding this truth because "these jokers are paying you lots of money to run that advertising!" He also blasts away at the lack of a decent structured-drawing program, the absence of support for color PostScript, and the instability of the tools we have.

We may not like what turncoats have to say, but they should be listened to—carefully. Yes, the Amiga can be a quirky machine. Part of this has to do with our multitasking, and those now trying to multitask with Microsoft Windows 3.0 are learning about the "unrecoverable application error," their form of the guru.

But that's not a complete excuse. My system sometimes crashes when I'm *single*-tasking, and I say it is because those who develop operating systems and write programs don't do enough testing!

I will, though, strongly defend the Amiga's lack of software, particularly in business applications. When Commodore tried, in the USA, to position the Amiga as a do-all, end-all machine, it failed. Businesses are saturated with boatloads of ultra-cheap clones from the Far East, and nothing's going to crack that market.

The Amiga is not an IBM clone. It is a specialized machine for graphics, animation, sound, music, multimedia, video, games, and programming. Unix workstations from Sun, Next, and IBM also lack many tools, but their excellence in special areas makes up for the shortage. The Amiga, too, can do quite well without Lotus 1-2-3 and Dbase.

No Excuse

But specialization is no excuse for software that crashes, fails to perform as advertised, or imposes its own oddball interface, and it is clearly no excuse for the failure to listen to customers and help them solve their problems.

We are trying to attract new users to our platform, users who have heard about the multitasking, the real-time animation, the video capability. The last thing they want to see is a flashing orange message from Hell.

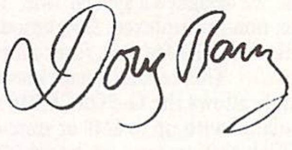
I've heard developers complain in turn that the reason they can't help customers or develop products as slick as those on other platforms is that the Amiga market is smaller, and they consequently make less money. But that's like saying, "I'm fat already, so why not have another Twinkie?"

Amiga owners pay money like anyone else, and they deserve customer support, good manuals, and stable, slick, full-featured products. If they don't get them, they may just turn away, and do their animation/graphics/music/video work somewhere else.

That's why *AmigaWorld* reviews point out the flaws, as well as the benefits, of Amiga products. We're not mean-spirited. We just believe that Amiga products should be judged in accordance with those on other platforms. And believe me, we take a lot of heat for this position, despite what Greene believes.

We know it's harder for our developers to provide superb products and give top-notch support in this market. The Amiga universe *is* smaller, and our software prices are lower. Still, companies must support customers or lose them.

So if you buy a product, and you're not satisfied, raise a ruckus. And if a company is not responsive to your complaint, scream bloody murder. It could be the best thing to happen to the Amiga since Andy Warhol. ■



G-FORCE 030™- 50/4



PRICE/PERFORMANCE VALUE OF 030 ACCELERATION AT THE ROARING SPEED OF 50 MHZ..

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IT'S A COMPLETE SYSTEM ON A SINGLE BOARD

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G-FORCE™ 030 COMBO

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For more information on how you can put the *Must Have* combo board — or any of GVP's growing family of A2000 combo boards to work for you — ask your GVP Dealer today.

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YOU'LL BUY IMPACT VISION 24 FOR ONE VIDEO NEED AND FIND YOU NEED IT FOR EVERYTHING VIDEO



Introducing the IMPACT VISION 24™ from GVP

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If you're into video, IMPACT VISION-24 is truly a dream come true for your A3000 or A2000. It is the first multi-function peripheral specifically designed for the A3000's video expansion slot.

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▶ **Flicker-Eliminator.** Duplicates and enhances the A3000's display enhancer circuitry. It even de-interlaces live external video! A must for any A2000 owner. Ask about our A2000 "genlock slot trade-up" program (in case your genlock slot is already used by something less exciting!)

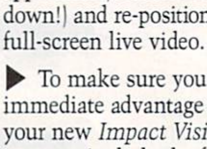


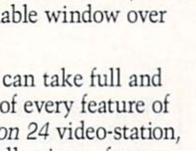
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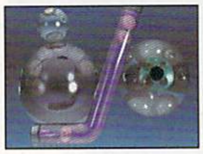
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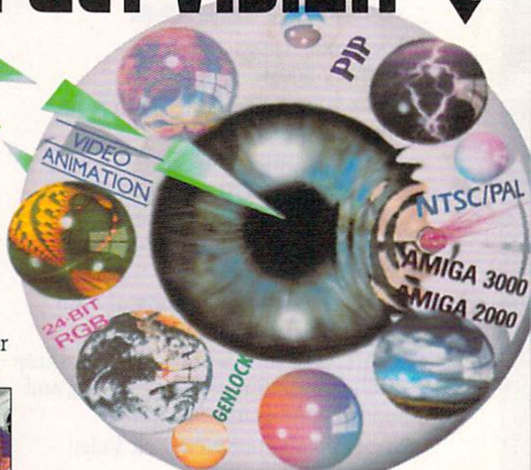




At GVP, we wanted to make a major impact on the use of the A3000/2000 by professional video enthusiasts. With the Impact Vision-24 we have!

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IMPACT VISION 24



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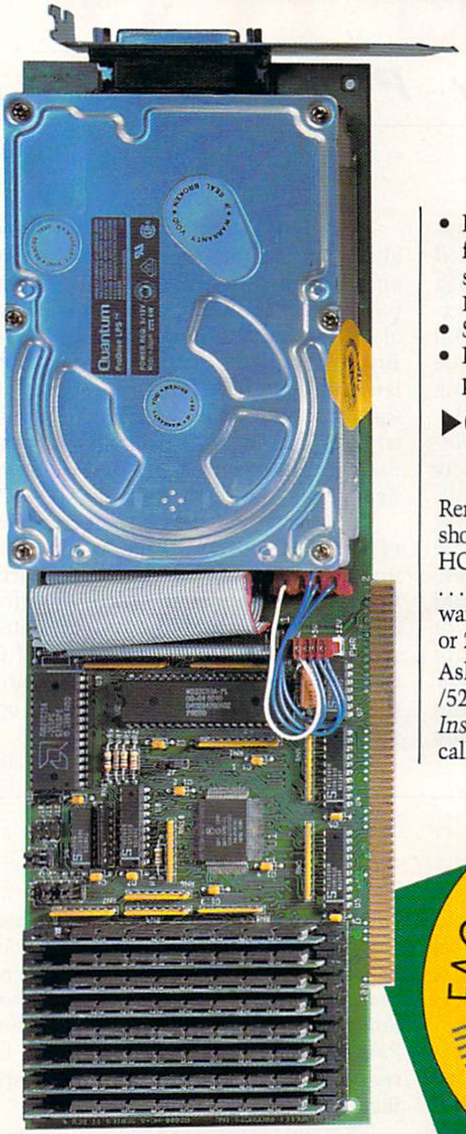
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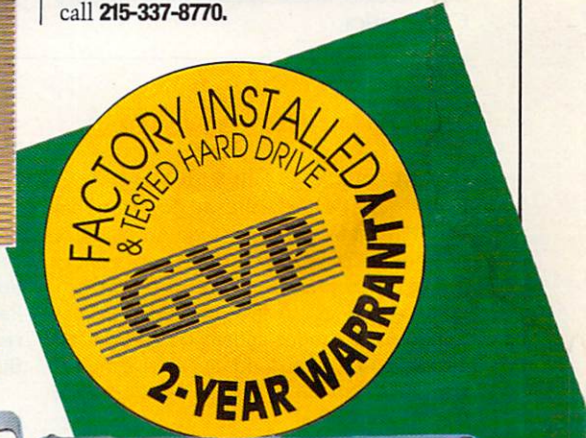
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OVERSCAN

News, New Products and Networks

The Great One

COLOGNE, GERMANY—What has more than 150,000 legs and descended upon Germany in October? The Amiga '91 Cologne Show! With almost 200 exhibitors in four halls and over 75,000 Amiga fans attending over four days, the show easily lived up to its advanced billing as the largest Amiga show in the world.

More than half the booths were devoted to European-developed productivity software and hardware products, with desktop video, music applications, RAM boards, and disk drives in the lead. Game vendors filled only one of the four halls.

The largest crowds collected around the Commodore booth, the largest of the show, where many Amiga fans got their first look at CDTV, the A3000T Tower and the A500 Plus. Commodore now boasts more than 100 available CDTV titles.

The biggest attraction of the show, also at the Commodore booth, was a new and still somewhat experimental Amiga-based product called "Virtuality," a virtual-reality simulation product from the British company W. Industries. Virtuality is a combination of "wearware" and software driven by an A3000. The wearware consists of a space-age helmet containing dual miniature LCD displays, stereo headphones, and a motion sensor.

The Amiga generates a virtual space of stereo sound and three-dimensional images that "move" as the wearer turns his head, creating an uncanny sensation of being inside the computer-generated scene. Additional sensors, attached to the arm and fingers, permit the wearer to reach for and manipulate virtual objects in virtual space.

While the displayed graphics are still somewhat simplistic, and the software did little more than demonstrate the features of the hardware, Virtuality demonstrates the great potential of the Amiga in futuristic simulation and game applications.

The other star attraction was a driving simulator, based on an Amiga, that is built into a real automobile, a Toledo sport model from the Spanish car maker, Seat. With special sensors attached to the steering, accelerator, and brakes of the car, and with the moving scenery projected onto a large screen in front of the driver, the simulator creates realistic driving situations. The simulator drew much attention, but the emphasis was on the car's capabilities, not the Amiga. (Too bad it wasn't a Ferrari!)

New American products introduced at the show included SupraTurbo 25 and

Continued on p. 16.

England Swings for Amiga

LONDON, UK—"Mad! Bad! And In Your Face!" That's how the ad for Ocean's new WrestleMania game read on the back of AmiEXPO's World of Commodore show guide. And that is how the event appeared—at least to this statesider, accustomed to the more sedate US shows. Of course, bad means good, but mad is mad—and there's no doubt that the British market is mad for Amiga!

The four-day show opened Thursday, November 14. On Saturday, the queue to get in stretched 50 yards out of the Earl's Court 2 convention center. Once inside, the 38,000 attendees were welcomed by show sponsor Future Publishing, which prints four Amiga magazines in England.

Although there were plenty of hardware and productivity manufacturers to be found, resellers and entertainment developers dominated the show. Flanking the Future Publishing booth were Electronic Arts and Mindscape. EA boasted Populous II, Birds of Prey (a flight simulator), and several other entertainment titles. In addition, folks crowded around to see DeluxePaint IV, demonstrated on Sunday by renowned14-year-old cartoonist Chris Blackwell.

Chris and his dad Mike run the nonprofit Harry Project, helping kids overcome their fear of hospitals by way of comic strips. During the show, Commodore agreed to donate an Amiga to every hospital in England, and EA joined in by promising DPaint copies for each. These donations will allow hospitals to customize the Harry cartoons for young patients.

Mindscape's huge display included a demonstration theater, which was usually packed with people eager to learn about the Miracle Piano Teaching System, which in-

Continued on p. 16.



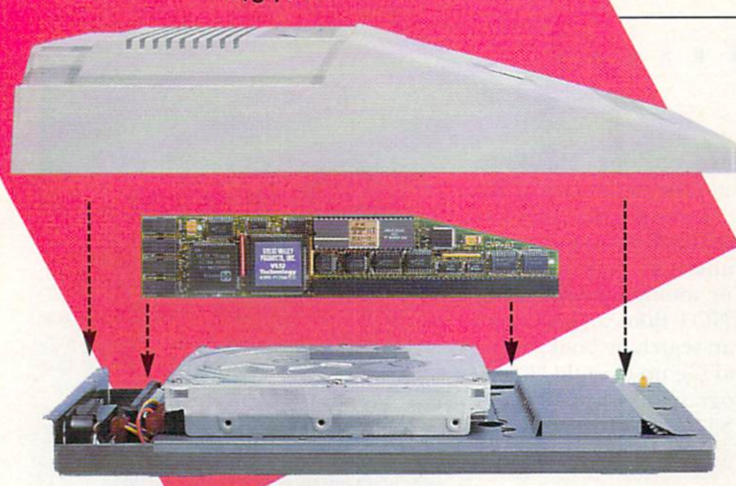
OVERHEARD

When Software Publishing Corporation purchased Precision's Superbase products, observers wondered what would happen to the Amiga line of the popular database. Now, it's time to sigh with relief. On November 13, Oxxi picked up not only the Amiga products, but also the Atari ST and C-64/128 releases. Support and upgrades for Superbase Personal (which Software Publishing had discontinued about a month before) and Superbase Professional are now available through Oxxi.

Meanwhile, a spokesman for WordPerfect announced that the company will no longer develop the Amiga version of its word processor due to lack of demand.

To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 112.

---MORE MAGIC FROM GVP---



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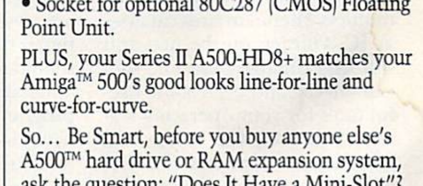
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And the Word Was...

...Explosive? With **TNT** ($39.95, ***Shocking Software***), which combines The New Testament and a study program, you can search The King James version of the New Testament for any word(s). A more complex search function lets you locate phrases that do not contain a specified word or string, and you can use the Print All command to output them. A handy Book Mark feature allows you to quickly move between selected verses. (RS# 115.)

Bible Search (***SOGWAP Software***) is available in either the King James or New International versions. Thanks to data compression, the entire text of the Bible fits onto two disks and the Exhaustive English Concordance fits onto one. Search functions include exact phrase, single or multiple words using AND, OR, and NOT Boolean logic, and wildcard. You can search by book, chapter, or verse, and use up to eight "bookmarks." The program sells for $100, and a demo disk is $5. (RS# 116.)

—BG



OVERHEARD

Users' groups unite! The Computer Desk is trying to arrange an international meeting of Amiga users' groups for the spring. The tentative site is Augusta, Georgia. If you have ideas or would like further information, contact the Computer Desk at 191 Old Wagener Rd., Aiken, SC 29801, 803/641-9016, Fax 803/642-6190.

Operation Speed Storm

It fits onto your A500 or A2000 processor socket. It attacks your applications with both 68030 and 68882 chips. It holds 1, 2, 4, or 8MB of RAM. It's **Stormbringer**, from German developer ***Memphis Computer Products***. The Stormbringer accelerator is available in several speeds; the 16-MHz board is $1099, the 24-MHz model is $1199, and the 30-MHz unit is $1549. The two top-of-the-line models are a $2349 board with a 50-MHz 030 and a 60-MHz 68882, and Stormbringer 55sync ($2599), with a synchronous 55-MHz processor and coprocessor, which promises to run 35% faster than the standard 50-MHz version. (Prices include 4MB ZIP-RAM.) The board provides a disable switch for finicky programs, and it comes with software that caches,activates burst mode, and loads Kickstart into RAM. (RS# 112.)

—BG ►



ON-LINE SCAN

By Tim Walsh

Electronic networks can serve as catalogs of aftermarket Amiga software. Instead, however, of the fuzzy dice and glass-pack mufflers offered in such catalogs as JC Whitney, on the nets you will find digitized sounds, special effects, and even some useful tools for your operating system. Switch on the Amiga of a telecommunications fanatic, and you will probably see and hear some unusual things. The standard Amiga screen fare has likely given way to fraudulent Guru messages, exploding windows, and animated requesters.

Thanks to my online excursions, my own Workbench screens hold the latest in screen blankers, pointers, 3-D icons, clocks, and backdrops. Fellow *AmigaWorld* editors never know what to expect when they insert or remove a floppy from my machine; the action may be acknowledged with an an angrily barking dog, or Scotty complaining of the Enterprise's faltering impulse engines.

Before making alterations to your Amiga's operating system, which is what is involved in installing many of these "finds," you must know how to undo any damage they may cause. If you are unsure how to recover and repair damaged directories, you should not customize your operating system. "Hacks," as these programs are known, can wreak havoc to hard disks by improper installation, so be sure to read the procedures carefully.

Always decompress downloaded files to your RAM disk or an empty floppy, not onto a hard disk. If you own a hard disk, you should always back up your Workbench and boot-partition files onto floppies or other media before embarking on a customizing crusade.

Finally, to avoid wasting time and money collecting a hodge podge of hacks that are incompatible with your system, read their file descriptions carefully before downloading. Make certain the file offers 100% compatibility with your Amiga's operating system (either 1.3 or 2.04 for A3000s and upgraded systems).

Because there are so many customizing files from which to choose, I thought it best to present a small sampler from each of the networks. One of my favorites on GEnie is PLAYBEEP_V1.1.ZOO from Library 4 (file #6242). This file replaces the system beep with your IFF sound file of choice. For enhanced appearance and functionality under Workbench 1.3, check out version 1.2 of Gary Knights's AmiDock, AMIDOCK.LZH (file #10424, Library 4). It gives your Amiga the NeXT computer's user interface.

BIX subscribers have access to a newer version of AmiDock (1.3) in the Amiga.user area. AmigaDOS 2.0 users should get a copy of AddTools14.lzh (also in the Amiga.user area). This is a must-have for making quick additions to the Workbench 2.0 Tools menu option.

CompuServe's Library 11 in the AmigaUser area is a haven for system enhancements. Need snazzy 2.0 icons? Get the files of WB2ICN.LZH. and EMBOSS.LZH for 2.0 and 1.3, respectively. If you use 2.0, don't leave that library without getting a copy of WBFED.LZH (version 0.93 of WBFed, a 2.0-specific font editor).

Not surprisingly, Portal offers the most complete collection of 2.0 enhancements to be found anywhere. I recently counted almost 60 top-notch 2.0-compatible hacks residing in the area with the no-nonsense name, "2.0-Only or Amiga 3000-Only Files." Favorites in this area range from the frivolous POINTERX2.LZH, which spins the hands on 2.0's busy clock pointer, to the useful WBGAUGE.LZH, which adds a full/empty gauge to 2.0 disk-icon windows.

BIX
One Phoenix Mill Lane
Peterborough, NH 03458
800/227-2983

CompuServe
PO Box 20212
Columbus, OH 43220
614/457-0802
800/848-8199

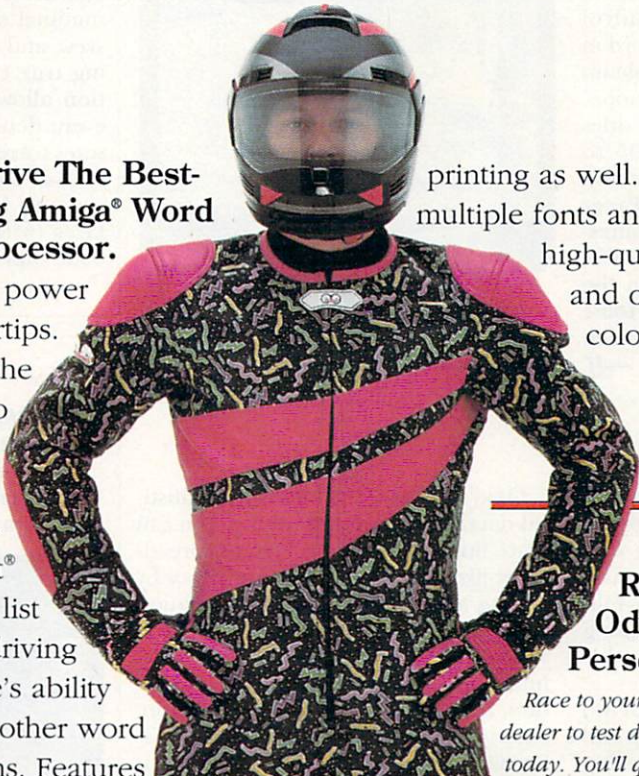
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You can hear the Amiga read the text that you"ve selected, and then get an explanation of it.

Get the Connection

Let your Amiga step right up and connect to any standard Novell NetWare network as a workstation or client with ***Oxxi***'s **Amiga Client Software**. Now you can enjoy the best of both worlds—full-range Novell NetWare functions, along with the Amiga's multitasking, graphic environment.

Amiga Client Software comes with two utilities. AmigaBack lets you back up and restore server-based data without leaving the Amiga workstation. NetMessage lets you send messages and attached files to those tied into the same network or, when these networks are tied via gateways, to people outside it. To run Amiga Client Software, you will need a LAN ARCNet or Ethernet card (one for each workstation, one for server), cabling, and IBM-PC-compatible servers running Novell NetWare version 2.15 or higher.

Oxxi's **P-Stat** offers interactive statistical data analysis and graphing. You can place numeric data into P-Stat's spreadsheet-like interface either manually or by cutting and pasting ASCII information from other programs such as MaxiPlan. With P-Stat, you can perform over 50 functions, including matrix multiplication, transposition, addition, inversion, logarithmic and nonlogarithmic transformation functions, and random-number generation complete with uniform, normal, exponential and gamma distribution. Once you have entered your data, you can employ the program's statistical tools to perform component and factor analysis, tabulation techniques, one- and two-way analysis of variance, regression, cluster analysis, and multidimensional scaling. (RS# 103.) *—JJ*

Red for Games, Yellow for Graphics

If cleaning up your hard disk is one of your New Year's resolutions, take a look at ***Display Systems International***'s **Hard Disk Organizer** (HDO). With HDO ($44.95), you can run games and applications by clicking on a button. If you wish, you can organize your applications by color. The program also features an unlimited number of buttons and a Pause command that allows multitasking programs to run before returning to HDO. (RS# 107.) *—JJ*

Flexible Fonts

Apogee 3D Fonts were designed for broadcast video. According to developer ***Digital Arts***, you can enlarge the hi-res characters five times and more with minimal distortion, and you can wrap, skew, and mold the fonts while preserving true curvature. Baseline identification allows accurate alignment, while even, dense distribution of vertices ensures correct Phong shading. Available in all 3-D formats, the first set ($29.95), contains Helvetica, Times, and Courier faces (with numerals and symbols) in bold. Stay tuned for more! (RS# 114.) *—BG*

Mean and Ugly

With **Volfied** ($39.95, ***ReadySoft***), you fight giant crabs, killer ladybirds, violent insects, and the ever-changing massive "Boss Alien" through 16 levels of arcade action. Do the job well, and you gain extra powers, such as lasers, power-ups, and time stops. Of course, there are surprises too, including hidden enemies and bonuses. (RS# 109.)



Strategy and reflexes. You need both to win at Volfied.

If it's spiders you abhor, here's a chance to get back at the long-leggedy creatures. ***Disney Software***'s **Arachnophobia** ($39.95), based on the film by the same name, may have you looking over your shoulder as you play (RS# 110.) *—JJ*

Clearer Vision

You will be glad to know that ***Commodore*** has been busy fine-tuning **AmigaVision**, its icon-based authoring language. Version 1.7OZ features the ability to chain applications together with simple icon control, and it allows you to manage your creations in smaller, memory expanding, modular programs.

In addition, version 1.7OZ boasts an upgraded standard-music file—including improved support for tempo, dynamics, and chords—and new video-device drivers. AmigaVision now lets you drive more peripherals from the serial port and offers six additional functions in the Expression editor. The new version retails for $149.95, and upgrades are available for $35. (RS# 108.) *—JJ* ►

What It Sees Is What You Get

Tired of keying in text? ***Migraph***'s intelligent **Optical Character Recognition**, based on an Omnifont engine, promises to recognize text characters you scan on a printed page and produce ASCII files for use with word processors or desktop-publishing programs. Migraph's OCR ($299) directly supports the Migraph and Golden Image hand scanner, loads IMG and TIFF files, defines text and graphic areas, includes four different linguistic databases—English, French, German, and Dutch—and lets you create dictionaries for multipage documents having the same types of characters (mathematical, Greek, and so on). The OCR requires 2MB of RAM and a hard drive.

Also from Migraph, a **Merge-It** and **Scanning Tray** hardware/software combination ($149) lets you scan full-page graphics and merge them to create one composite image. **Scan & Save** ($20) provides the capability to scan and save an image if that's all you need. Migraph also released version 2.0 of **Touch-Up**, its hi-res scanning and image-editing program. The new version provides a custom screen and an image viewer to preview monochrome, color (including HAM), and gray-scale IFF files. You can also specify the degree of overscan and load an image automatically at the launch of Touch-Up. (RS# 102.)

—JJ

The Great One, from p. 10.
SupraTurbo 68040 cards from Supra, 68040 and 24-bit video cards from Great Valley Products, plus an assortment of RAM boards, hard-disk drives, accelerator boards, and emulators.

New European software products included a development environment and language called "Cluster" from the German publisher DTM, described by the developers as "a cross between Modula-2 and C." There was also an Amiga-based hotel/airport information-display package called InfoChannel, based on the very popular multimedia-presentation package Scala, from Digital Vision of Norway, and a user-friendly database-design package from C-Laboratories of Germany.

As you might expect, PAL-only European products dominated the video hardware arena, with European developers filling the gap left by American (NTSC) video vendors.

In the world of games, the most interesting developments centered around CDTV, with new products released or announced by Virgin, Lucasfilm, Psygnosis, and Korona Soft, among others.

In an effort to encourage wider distribution of Amiga products on both sides of the Atlantic, Commodore CATS US/Europe arranged a day-long meeting between more than 100 Amiga developers and ten Amiga distributors from the US and Europe. Several European distributors later reported a significant increase in developer interest in European distribution of their products.

Amiga '91 was impressive. The crowd was so big on Saturday that getting around inside the show required real effort and determination. This show proves once again that, at least in Europe, the Amiga gets the respect it deserves!

—George Chamberlain

England Swings, from p. 10.
cludes a MIDI keyboard and music-instruction software. Outside, crowds queued to try out such games as Ultima VII, Paperboy 2, and Captain Planet.

Psygnosis showed off its arcade-adventure Leander, the scrolling shoot-'em-up Agony, and more favorites. Next door, Virgin Games upheld its' "pure entertainment" credo with such new releases as Jimmy White's Whirlwind Snooker and Conan the Cimerian.

Contributing to the party-like atmosphere was Ocean Software's "booth," which consisted of a whirling-teacups-type carnival ride. Around back were some of Ocean's games set up in arcade consoles. Among the titles Ocean promoted were Terminator 2 and The Simpsons.

Gremlin Graphics Software made a big hit with its Lotus Turbo Challenge auto-racing game; lured by its video-wall screen, folks lined up to take turns "driving." Meanwhile, MicroProse (Silent Service II and Knights of the Sky), Domark (Shadowlands role-playing adventure and Trivial Pursuit on CD), UBI Soft (Battle Isle, Celtic Legends), and other entertainment developers competed for the attention of game-loving attendees.

Beyond Games

Those who sought fun but not games were pleased to find a demonstration of The Blue Ribbon SoundWorks' SuperJAM!, an easy-to-use composition program that a number of graphics programs promise to support directly. On a more serious note, Digita International showed its Home Accounts 2 finance program and Wordworth word processor.

Great Valley Products and Supra had booths as large as most game manufacturers. Both companies touted 68040 accelerators, and GVP's IV24 picture-in-picture video card made appearances at both GVP's booth and Commodore's display.

Commodore had two booths, one housing computers and the other packed with CDTVs. In the computer camp were the A1500 (an A2000 without PC slots) and the A500 Plus (with 2MB chip RAM and more), neither of which is available in the US. Some American developers, including Digital Creations and Micro-Systems Software, set up shop there, as did British educational-software developer Think Ltd.

At the overpopulated CDTV City, scores of applications demonstrated developers' growing commitment to the system. Connected to one unit was Commodore's AVM enhanced-display product for CDTV.

Rombo Ltd. showed up in living color to demonstrate its Vidi-Amiga real-time black-and-white/still color video digitizer. An upcoming bundle will reportedly include a sketch tablet.

A graphics device of a different sort was on display at Amiga Centre Scotland's booth, that being the Harlequin 32-bit (24 bits/pixel, plus an optional extra eight bits for more functions) framebuffer. (At the time of the show, it was out to a handful of developers in the US to garner support for its NTSC release.) The board comes packaged with its own TV Paint and Active Circuit's RasterLink conversion software; several other graphics programs promise to support it.

HiSoft announced a new version of its assembler/debugger in addition to its new Turbo Pascal-compatible compiler, High Speed Pascal.

While The Vivid Group was not in attendance, the UK distributor of the company's Mandala virtual-reality system was. The Mandala/Live! (A-Squared) combination drew aisle-blocking crowds with demonstrations in which onlookers were invited to take part.

But the crowd gathering for the Mandala display was nothing compared to the throngs at the back of the convention center, where most retailers were. A popular London radio station added to the excitement by broadcasting live from the show, and nearby, as folks queued up to join the Video Arcade (50 pence bought you 15 minutes of time with popular games; the proceeds went to charity), Commodore sold logo-emblazoned sportswear. With this kind of enthusiasm—and support from CBM to boot—is it any wonder the Amiga is England's most popular computer?

—BG ■

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DELUXEPAINT IV

ELECTRONIC ARTS

A new chapter in Amiga art.

By Mark Cashman

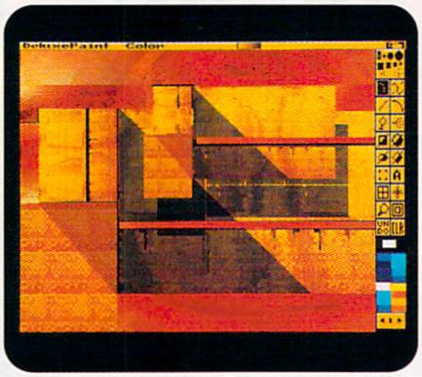
THE ORIGINAL DELUXEPAINT followed closely on the heels of the Amiga's launch. Even though the first version was well received, ***Electronic Arts*** immediately set the wheels in motion for an extended period of growth. In its third version, DPaint took a dramatic leap from mere static painting to animation.

While it has been considered a staple of Amiga artists over the years, some expressed one or two misgivings, mainly concerning the lack of Hold-and-Modify (HAM)-mode support. Long limited to 32 colors (or 64 in Extra_ Halfbrite mode), DPaint IV ($179.95) can now handle the 4096 simultaneous colors of HAM.

In addition, the new version offers a wide variety of new or greatly enhanced features, including new gradient fills, a color mixer, and improved ranges. Particularly significant are additions to DPaint III's animation module, namely, a new Animation Control panel, brush-morphing capabilities, and a Light Table function for key-frame animating.

DPaint's newfound support for all native Amiga color options is still subject to normal Amiga restrictions, so you can use HAM only in lo-res and lo-res overscan horizontal resolutions, and with no more than 16 colors in hi-res and hi-res overscan horizontal resolutions. HAM capabilties extend throughout the program's features and tools, including animation.

Handling of overscan has improved in that you can now use the entire overscan screen for painting. Previously, the screen provided only a view onto a larger, overscan-sized bitmap that you needed to scroll to use.



Realistic effects in DPaint IV' HAM mode.

A DECIDED EFFECT

Under the Effects menu, DPaint IV provides some special options that work well with HAM. Translucency, particularly suitable for drawing shadows, lets you mix the colors from your brush with the colors in your backgrounds in specified proportions. The Tint, Hue, and Value Process options allow the current brush to affect the background only with the tint, hue, or value of its colors. These functions allow you to add effects to work in progress.

With the new Color Mixer, you can mix existing colors to create new ones, much as in traditional painting. You can change the palette's 32 colors with the updated Palette requester and keep up to 256 colors in a palette in HAM mode, most of which are unassigned at the beginning of a session. Changing colors in a HAM palette does not affect the on-screen colors.

If you are new to *any* version of DPaint, some things may seem atypical to you. Oddly, the program does not provide a three-paned representation of the RGB color cube on which you click to select a color. This is a standard feature of the other major HAM paint programs, and I was surprised it was left out.

The Palette requester, like other requesters in DPaint, does not follow the Amiga standard. For example, you use arrow buttons and numeric text entry in place of sliders. Also, the Palette requester, like some other requesters in DPaint, is on a screen of its own, raised only partially from the bottom of the screen, which makes it easy to accidentally lose it behind the DPaint screen.

DPaint IV's use of ranges is vastly improved. Ranges, for color-cycling animation and filling objects with gradients of color, are no longer restricted to the order of colors in the palette. You can create up to eight ranges, each consisting of up to 32 colors.

PAINT-FILLED CENTERS

An area where DPaint IV shows a tremendous amount of progress is with its two kinds of gradient fills. Based on the program's improved ranges, these fills let you easily create complex, shaded images. As in its previous version, DPaint IV provides support for linear gradients and for directional gradients that let you specify both the direction of a linear gradient and the central points for radial gradients.

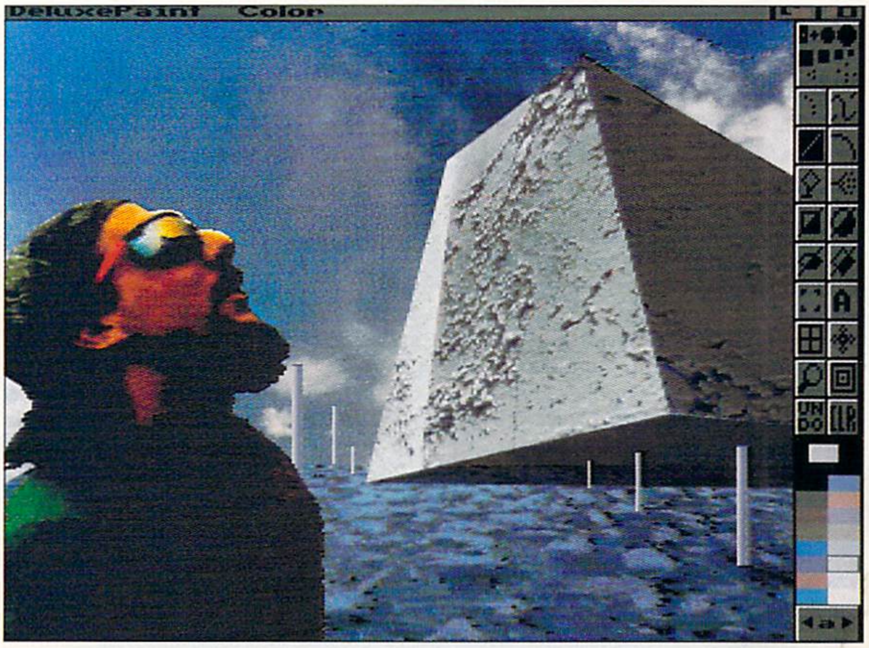
Gradients come in one of two possible dither styles, Pattern and Random. When painting with Pattern, colors will appear ordered with smoother transitions. If you click on the Random button, you can give your colors an uneven appearance.

Five new gradient fills bring the total to eight. Of the two new linear gradients, Line lets you specify fill angles around forms, and Shape, similar to the left-to-right linear fill, lets you direct the fill's angle. Of the

To locate the vendors of products reviewed, see the "Manufacturers'/Distributors' Addresses" list on p.112.

three new radial gradients, Circular fills outward from a central point in concentric circles, Contours conforms gradients to the shape of a filled area, and Highlight closely simulates shading from a single light source. (See "Accent on Graphics" on p. 60 for more detail.)

DPaint IV's fills improve with the added colors, although I found neither Random nor Pattern dither to blend well with less than five colors in a range. Generally, DPaint's gradients are not as smooth as those in Digi-Paint (NewTek) or Photon Paint (now SpectraColor, from Oxxi). The variety in DPaint's gradient orientation is similar to that in Digi-Paint, but not as great as that in SpectraColor.



The sky's the limit with DPaint's new range of colors.

Animation

You can incorporate more colors into your DPaint animations, thanks to the program's new HAM-mode support, and you can now animate HAM brushes. Another important change to the animation module is the new Animation Control panel. With these VCR-like controls, you can add or delete frames, play your animations forward and backward, either continuously or one frame at a time, and loop them. The panel's Go to Frame button is linked directly to a requester where you can enter the number of a specific frame and have the program bring it up.

If you click on the Play Ping Pong button, your animation will play forward to the end and then play in reverse back to the beginning, continuing on indefinitely until you stop it. The Add a Frame function produces copies of frames. You can also delete single frames with the Delete a Frame function.

In the Brush menu, Metamorphosis lets you create morphed brushes. The program lets you define a starting brush and a quite different ending brush; then the program blurs one into the other over several predefined frames, the whole of which you can save as an animbrush. (This function differs from tweening, which makes use of the same type of computer-generated animation, except that with tweening, the two brushes are essentially the same character or object, but just in a different position or attitude.) This effect is particularly spectactular in HAM.

To help you create cel and character animations, DPaint IV now offers Light Table, a key-frame animation tool found in the Effects menu. Light Table lets you see previous frames below the image of the current frame, which is especially useful for character animation.

Renewable Resources

DPaint IV is a large program, requiring 282K on disk. A normal lo-res screen with 32 colors uses 40K of memory. A lo-res, interlaced HAM screen requires 96K of memory. To conserve memory, you can take advantage of an option that lets you load parts of the program into RAM. Electronic Arts recommends 2MB of RAM, although only 1MB is required. Again, although not required, the program could make good use of the Super Agnus custom chip, with its full 1MB of chip RAM.

DPaint is a powerful, mature program. Many artists still consider it the workhorse of Amiga paint programs. At the same time, even with all of its power, it remains the best paint program for the first-time Amiga graphics artist. And, in responding to criticism of the program's former lack of HAM support, Electronic Arts has eliminated DPaint's single greatest drawback.

The manual is excellent. It is well laid out, contains useful and interesting tutorials, and covers the full range of program operation.

My criticisms of the program in general concern its nonstandard requester layout and menu details, which I believe detract from its operation. Also, DPaint's memory requirements continue to increase, slowing its operation. Fortunately, it is still possible to use it on small-memory Amigas, thanks to the efforts of the programmers to provide memory-saving options.

In short, DPaint is a good value and is a must for every Amiga owner interested in graphic arts—professionals and dabblers alike.

Personal Write

Cloanto/Centaur

You get what you pay for.

By Dave Johnson

A NEW WORD PROCESSOR is something the Amiga market hasn't seen in some time, and it was with some anticipation that I tore the wrapper off ***Cloanto***'s Personal Write ($49.95) and tossed it into the disk drive.

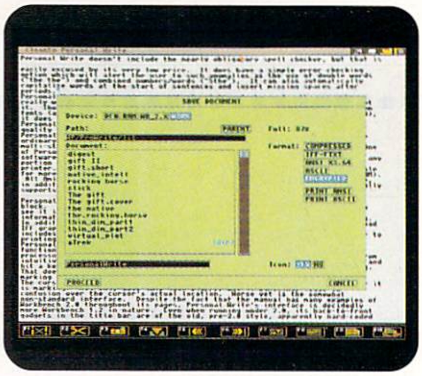
This package turns out to be a well-featured, quite inexpensive program aiming to fill the niche of a professional word processor that handles only text and printer fonts. Unfortunately, it accomplishes that goal with only moderate success. It not only acts and feels more like a text editor, but it places demands that would frustrate even the ►

most dedicated of Amiga-literate writers.

The Introductions

Personal Write installs neatly onto a hard drive. By default, it opens to Workbench-screen format, a handy feature if you like to resize your work area. To perform some of the program's most common word-processing tasks, consult the line of icons adorning the bottom of the screen. These buttons, which you can assign to your keyboard function keys, let you perform ten operations: Cancel operation, Cut, Copy, Paste, Move cursor to beginning, Move cursor to end, Remember cursor position, Mark block of text, Mark page, and Print. The program's six menus provide access to its other features, such as configuration options, mail merge, error handling, and statistics.

The document window is not What You See Is What You Get (WYSIWYG); instead, it displays text in single-spaced Topaz. The program attaches paragraph symbols to lines ending in hard returns, and shows page breaks if you define page length in the format requester. Unfortunately, there is no scroll bar on the side of the document window, which makes it difficult to move quickly to specific points in the text.



PW saves documents as compressed files.

You will need to get used to the way the program handles text blocks. In most word processors, you simply highlight a block of text and then select Cut, Paste, or some other text function. In Personal Write, that sequence happens the other way around: You first select the text operation, and then the title bar prompts you to highlight the desired block of text. In fact, it is generally not possible to select a block of text until you request an operation.

To its credit, Personal Write provides some unique features. It lets you save documents as compressed files that are about 60% smaller than a comparable ASCII document. This feature is great if you have limited storage capacity. In addition, you can optionally encrypt documents so that a keyword is necessary to load and read the file. While encryption algorithms—and their effectiveness—vary considerably among computer programs, it turns out that Personal Write's is fairly deep. Rather than simply shuffling header data, Personal Write completely scrambles the file, making it impossible to recover any meaningful data without the key. In fact, Cloanto states in the manual that if you forget your code, you are on your own.

Cloanto designed Personal Write to act as common ground between a variety of computer formats and languages. Using the file-format menu, you can configure it to load or save files using character sets from the Amiga, Mac, IBM, or Atari, as well as the Commodore 64 and international ASCII keyboard layouts. If you tell Personal Write that a document is written in English, Italian, German, French or some other language, the program tailors its error handling to detect certain kinds of typing errors. You can also modify the interface to

display in a variety of languages.

Free-Form Modeling

Quite a few of the program's features are configurable. It provides stereo audio cues for menu and requestor selection, and makes the keys click when you type. Via a palette requestor, you can change the screen colors and adjust many other options.

Personal Write does not include the nearly obligatory spelling checker, although its very low price excuses it. It does have a simple error-checking option that alerts you to such anomalies as double words ("the the") and number/word combinations ("5the"). It can also automatically capitalize words at the beginning of sentences and insert missing spaces after periods.

The program provides a wealth of printing features for those who prefer customized output and are willing to put in the extra effort. Although it cannot print Amiga system fonts (a true detriment now that outline fonts have arrived in Workbench 2.0), it does support downloaded printer fonts. Using a program like Cloanto's Personal Font Maker, it is possible to create a wide variety of extremely high-quality printer fonts that you can include in your documents.

Personal Write supports several printing options, permitting bold, italic, and underline formats, as well as any number of multi-strikes (good for high-quality print saturation on 9-pin printers). Most notably, thanks to Personal Write's software printer spooler, you can dedicate any portion of free RAM as a buffer to queue files for printing. This means that you can begin typing something else as soon as you've sent a job to the printer (given sufficient RAM). All Amiga word processors should include this outstanding feature. Finally, in addition to using the Amiga's standard printer drivers, Personal Write fully supports PostScript.

The program can print an entire document, just a page, or a marked block. What's more, it lets you preview the finished product on screen, so that you can see slightly more of a WYSIWYG version, including the headers and page numbers. You can also use Personal Write to load and print IFF graphics, although you cannot combine them with text. The program's simple palette tool lets you adjust colors before printing.

Parting Ways

Personal Write has its share of problems. First, it functions too much like a text editor and not enough like a standard word processor. In other word processors, it is as instinctive as breathing to select text with the cursor and hit a keyboard shortcut for Cut, Copy, or Paste. Highlighting text *after* selecting a cut/paste function is far from intuitive.

The cursor itself is oddly sized, and doesn't completely cover the character it is marking. Not only does this look sloppy, but it sometimes leads to confusion over the cursor's actual location. Worse yet is the somewhat non-standard interface. Despite the fact that the manual contains many examples of Workbench 2.0, Personal Write's interface is decidedly more Workbench 1.2 in nature. Even when running under 2.0, its back-to-front gadgets in the title bar are of the old, pre-2.0 style, ►

Circle 177 on Reader Service card.

apparently hard-coded that way.

Furthermore, not only are the requesters not up to Workbench 2.0 standards, but their scroll bars are oddly designed. If there is only one file or directory too many to fit in the requester window, you must pull the scroll bar down to the bottom just to make that one file visible. Clicking under the bar unexpectedly causes it to advance only a few pixels at a time.

Finally, I have to question the user-friendliness of the formatting options. The program comes without useful defaults, so the new user must completely configure the word processor before he can hope to get a useful hard copy. I've never before used a word processor that was so hard to set up. The Tab key comes without any value assigned to it, paragraphs don't auto-indent, and before you *can* indent, you have to assign an indentation value to the tab key.

It even took me several days to figure out how to double-space my printout. Although the line-spacing option is in the printer options requester, Personal Write will not display on-screen in any form except single spaced, regardless of the spacing you select. I might have had better luck finding this information in the manual if it weren't filled with so many facts about general computing. I hope Cloanto's other product manuals are more focused.

In summary, Personal Write is a solid, inexpensive, but somewhat frustrating word processor. I would not recommend this program to the creative writer, because I don't feel its operation is sufficiently fluid and intuitive. Many of its features, however, like data encryption, PostScript output, and the variety of languages and character sets supported, do hold a certain amount of appeal.

A500 Hard-Drive Expansion Boxes

Comspec's SA 500
DataFlyer 500
GrandSlam 500
Trumpcard 500 Series

Metal boxes
Metal boxes
Metal boxes on the left side
And they're all filled with hard drives
But they're not all just the same.

By Morton A. Kevelson

STORAGE, STORAGE, STORAGE. We can never have enough digital storage. A500 owners especially feel the pinch. With only half a megabyte of internal RAM and a single 880K floppy disk drive, its data storage capacity is just not up to the demands of a typical Amiga application. Fortunately, not only do A500 owners have many storage options from which to choose, but prices are also coming down.

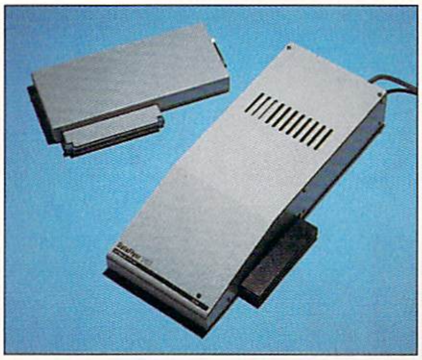
Unless you have grandiose plans for expanding your A500, an expansion-port plug-in box—one that combines both a hard drive and memory—will probably meet your needs. In this report, I'll show you how to save money with do-it-yourself systems. By purchasing an expansion box with a hard-drive host adapter and then adding memory and a hard drive on your own, you can save a considerable amount of cash compared to a comparably equipped turn-key system.

The following report covers Comspec's SA, Expansion Systems' DataFlyer, and IVS's Trumpcard A500 series.The beauty of these products is that you can play a primary role in tailoring your system according to your needs.

Say Again

The A500 version ($199, US) of the ***Comspec*** SA-series SCSI host adapter is housed in a very sturdy heavy-metal enclosure. It is the smallest unit of this group, measuring in at only 4×9½×1 inches, but keep in mind that this is only the SCSI host adapter. To complete the system, you will have to supply a self-powered SCSI hard drive in its own enclosure and a 25-pin SCSI-interface cable. For this review, I drafted from my A1000 a Seagate ST-157N 48MB hard drive in a Xetec self-powered enclosure. The SA host adapter is fitted with a red drive-activity LED at the front, a 25-pin SCSI connector on the back panel, and an autoboot-selection switch accessed through an opening underneath.

Although the set-up program had a point-and-click user interface, it was



The Comspec and the Data Flyer.

confusing and limited. I ultimately succeeded in formatting the hard drive with two partitions via trial and error. The set-up software handles only low-level formatting and partitioning. You perform high-level formatting and software installation through the Workbench or CLI. What's more, the SA SCSI host adapter requires that you format a boot partition with the old file system, although you can format all other partitions to use the newer fast-file system. I ran the performance tests on a fast-file system partition.

The performance of the SA SCSI host adapter is a bit slack, even considering the slower performance of the Seagate hard drive. After my experience with the A2000 version of the SA host adapter, I made sure to set the test intensity to low. This allowed the test with DMA and CPU contention turned on to run to completion in only 30 minutes. Another drawback is that Comspec chose not to provide for memory expansion, something to keep in mind if you plan to add memory in the future.

Although the SA Series SCSI host adapter lacks some of the features of the other host adapters, it is one of the few units that support the Bernoulli removable-media drives. Bernoulli systems, which utilize large-format enclosed floppy disks, are more expensive, but they have developed a reputation for reliability.

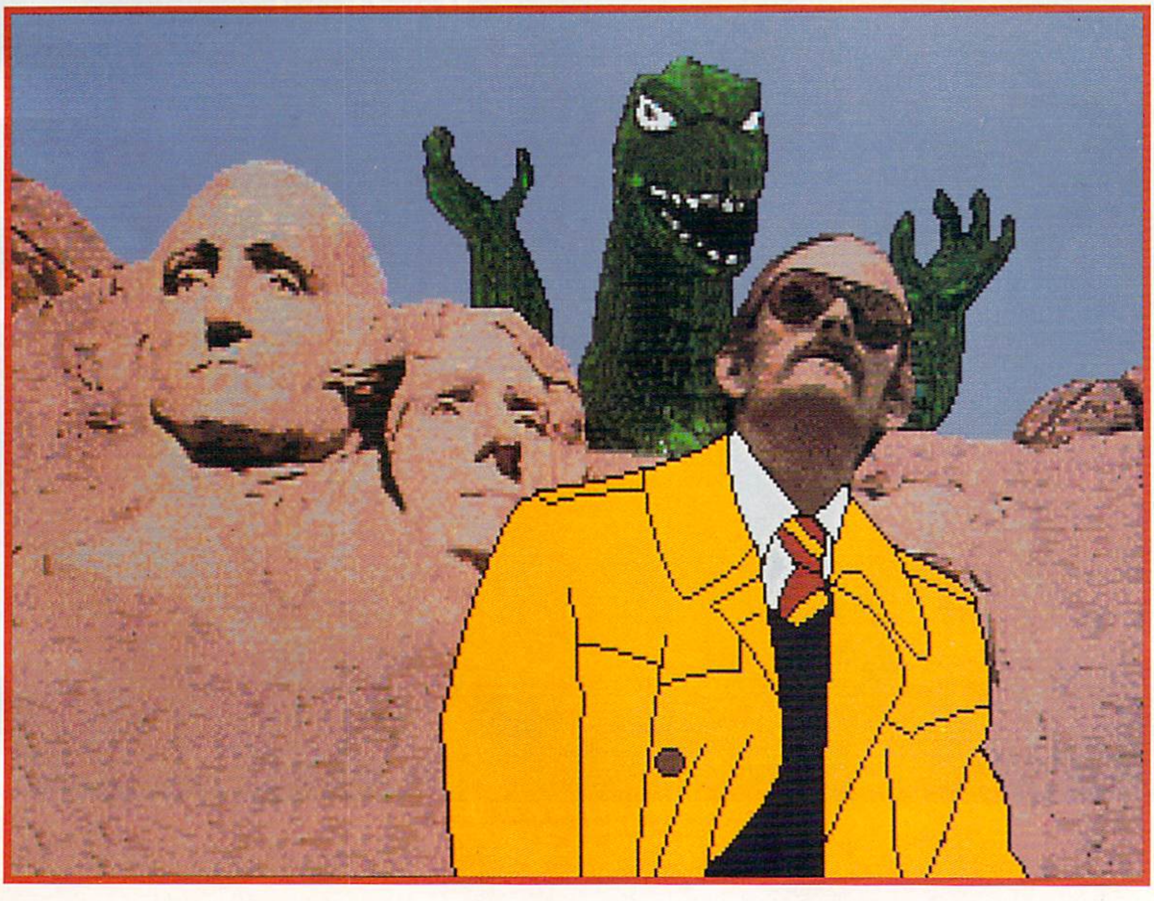
Flying High

The DataFlyer 500 ($239.95) from ***Expansion Systems*** comes in a rather bulky all-metal enclosure measuring

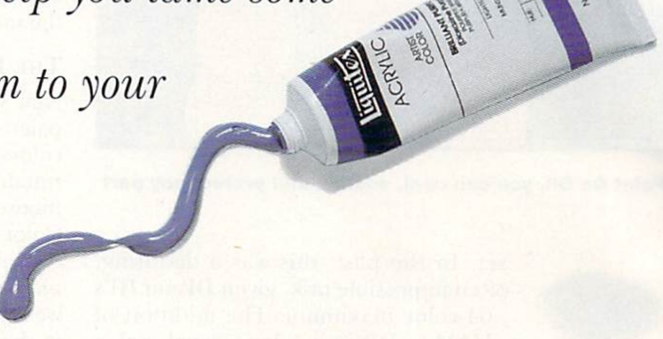
Continued on p. 92.

Great Graphics, Godzilla, It's DPaint IV!





The fourth incarnation of the Amiga's most popular paint program is packed with fine new features. Here are some tips to help you tame some of its tools and use them to your best advantage.



By Gene Brawn



The long-awaited update to ***Electronic Arts'*** DeluxePaint paint-and-animation software is sweeping the Amiga community—and it's everything it was rumored to be. **DeluxePaint IV** ($179.95) now allows you to paint and animate in 4096-color Hold-and-Modify (HAM) mode, and offers powerful, time-saving new tools. While the DPaint manual is excellent, it cannot possibly tell you everything without becoming an epic-length tome. To get you beyond the basics, I have picked a few of the more exciting and useful tools as a practical demonstration of the program's new powers. Because many of DPaint IV's enhancements are most effective in HAM, the following tutorials are designed around this mode. You can use these techniques in any other painting mode, however, given enough colors and the right palette. (For a complete review of the new DeluxePaint, see p. 18.)

Project #1: Fun With Color

Our first project demonstrates some tools that you will employ nearly every time you fire up DPaint IV. First you will use the completely revamped Palette requester and its new Arrange function to create a single palette from three disparate images. Then you will use the new Stencil Paint, Translucency, and Process functions to composite the three images on a single screen. This example uses artwork I created for the Bonus Utilities disk included with the DPaint IV package, so you will be able to duplicate my tips using the actual images referenced in this article.

In order to combine images with differing palettes, you must first create a single, compromise palette and remap each of the three pictures to this new color ►



Figure 1. With Paint On/Off, you can coat, soothe, and protect any part of an image.





set. In the past, this was a daunting, often impossible task, given DPaint III's 64-color maximum. The addition of HAM to DPaint's color arsenal makes the process much easier.

Your first step is to remove from each image's palette any colors that are not used. Start by loading the Godzilla.ab file from the DPaint IV demo disk as a picture. Press the right mouse button to display the menu bar and pull down the Picture menu. Select Screen Format and click on 16, then on OK. In a moment, Godzilla reappears with a 16-color palette. Reselect the Screen Format requester by pressing the a key and, this time, click on HAM to convert the file to that mode. Save the file with a new name, and repeat the process with the file named Rushmore.bg.

The third image, Lookingup.ab, is a special case that requires some extra work. What you need to do is remove the skyscraper from the picture's background before you reduce the number of colors. Normally, you would use the Stencil tool to protect the colors in the man, and then clear the screen to eliminate the unwanted portions of the image. That process will not work here, as some of the background colors are also present in the man.

Fortunately, DPaint IV includes an enhanced version of the Stencil tool—called Paint On/Off—in the Effects/Stencil submenu. Selecting the Paint On/Off tool causes the screen to dim. Click the Freehand Fill function from the toolbox and carefully outline the figure of the man in the trench coat. If you make a mistake, you can use the right mouse button to erase the errant lines. When you are finished, the entire figure of the man should be covered with a translucent mask (see Figure 1).

Be sure to reselect Paint On/Off from the menu to turn it off, or the next step may yield unpredictable results. From the palette, select sky blue as the background color and then clear the screen. Only the man's image should remain. Turn off the stencil by pressing the ~ key. Now you can safely use the Screen Format function to reduce the number of colors to 16, convert the image to HAM, and save the file.

The Big Squeeze

Now you are ready to build your new "compromise" palette. What you must do is squeeze the remaining 48 colors (16×3 images) into a new 16-color HAM palette suitable for all three source pictures. Press the right mouse button to display the menu bar and go to the Color menu. (Note that DPaint's color tools are now consolidated here—a definite improvement over the old version's helter-skelter arrangement.) For this step we'll use two new tools: the Arrange selection, found in the Palette submenu, and the Color Set requester.

Choose the Arrange selection first. When you do, you will see your current 16-color palette along the top row and three more rows of "ghosted" squares below it (see Figure 2). This is your main color work area. Using the gadgets along the bottom edge of the display, you can pick colors from the screen, create a spread, and then copy or exchange them from one color register to another.

The last gadget in this set, Delete, is a powerful new function with which you can eliminate a color or a range of colors from your palette. Try it by clicking on color 0 at the far left of the top row and then clicking on Delete. When the cursor changes from an arrow to the word To, click on the last color in the row—that is, color 16. Instantly, all the colors in your palette are "ghosted" and your screen turns white. (Click the Undo button at the bottom right of the requester to return things to normal.)

Let's fill in a few more of those empty boxes and build our new HAM palette. With the Arrange requester still visible, select the Color Set item from the Color menu. When the File Load requester appears, select your new HAM version of the Rushmore picture. Instead of loading your image, the program displays a new requester, similar to the Arrange requester. Click on All to load all the palette's colors, and then click on Add to append this color set to the current palette. When the Arrange requester reappears, it will contain 32 colors: your original palette in registers 0 through 15 and Rushmore's 16 colors in slots 16 through 31. Click on OK to close the requester.

Now return to the Color/Palette submenu and select Mixer. What appears is a new version of DPaint's Palette requester. For now, you will use it to compare hues and delete the duplicates. Some are easy to see—yellow and red, for example. Simply click on the duplicate color, select Delete, and finally click on the duplicate again to remove it. Finding the other clones is easy, but tedious. Starting from the left, click on the

first color and remember its RGB value. Moving to the right, click on the remaining colors in turn, deleting any with the same RGB value.

You now have a color set full of holes where the duplicate colors used to be. An easy way to close the gaps is to use the Color Set menu selection to save the colors as a new file and immediately reload the data. Since the Color Set tool does not save the ghosted positions, reloading the file with the Overwrite option closes the gaps. This makes for an easy way to "pack" your palette.

Now comes the most important step—creating your final 16-color HAM palette from the colors remaining in your palette. If you do not have the new version of the Lookingup image loaded, call it up now. Then use the Color Set requester to replace the existing palette with the one you built in the last section. There should be no change in the image, as the base colors (the lower 16) came from this image.

Next load the HAM version of the Rushmore picture, select Restore Palette from the Color/Palette menu, and then remap it with the tool of the same name in the Color menu. If you are not happy with the results, you can use the Copy button in the Arrange or Mixer requester to move more appropriate hues from the upper 16 colors of your new palette to the lower 16 (base) colors.

This ability to swap is the reason for building this 32-color palette. Remember that all these pictures are now in HAM format, yet they use only the first 16 colors of the palette. The upper 16 are there for convenience should you need to modify the palette to reduce fringing or create a color for one of the other pictures.

To change your palette, pick a color to sacrifice in the lower 16 and replace it by copying a spare color to its slot. Remap the picture to test the results. If it does not look right, select Restore Palette from the menu and reload and remap the picture (you cannot undo a Remap function). Try again until you are satisfied, and then save the new version of Rushmore.

Paint It Green

The third component of our composite image is Godzilla from the Godz&Ted.ab file. Once you load this picture, the first thing to do is fill the red background with the sky- blue color in register 15. There is not enough room in our palette to include any of Godzilla's monochrome gray scale. This presents a problem, because HAM mode has a difficult time creating grays from other hues (the result is usually a fringing nightmare). You can get around this, however, by changing the monster's color to something more appropriate for HAM—and DPaint IV's Tint tool can help.

To turn your black-and-white monster to a gorgeous green, load his newly remapped image and select the Palette/Mixer requester. Click on any register in the upper 16 and set the RGB sliders to 0 red, 0 blue, 15 green. Click OK to exit. Set the background color to blue and pick up Godzilla as a brush with the left mouse button. Go to the Effects/Process submenu and, if Tint is selected, choose On/Off (otherwise, select Tint and press Alt-p). Make the brush solid green by pressing the F2 key, then place the brush precisely over the Godzilla image and click the left mouse button.

Slowly, your monochrome monster will assume a green tint. But there's one small problem: His eyes and teeth should be white. To remedy this, press the u key to reset the image to its original colors. Turn on the Stencil/Paint option (remember the trench-coat man?). Select white from the palette and Freehand Fill from the toolbox, and outline the reptile's eyes and teeth as if you were painting normally. Return to the Stencil menu, turn off the Stencil Paint option, and repeat the steps above to effect the tint. This time, the monster's eyes and teeth will remain a pearly white.

Finally, you are ready to meld the three images. Start by loading the Rushmore picture. Next, press the j key to summon the spare screen and load your green monster there. Pick Godzilla up as a brush, switch to the main screen, and stamp him down in the notch above Teddy Roosevelt's head. Follow the same steps with the man, stamping him down in front of the mountain, and you are done (see the opening illustration).

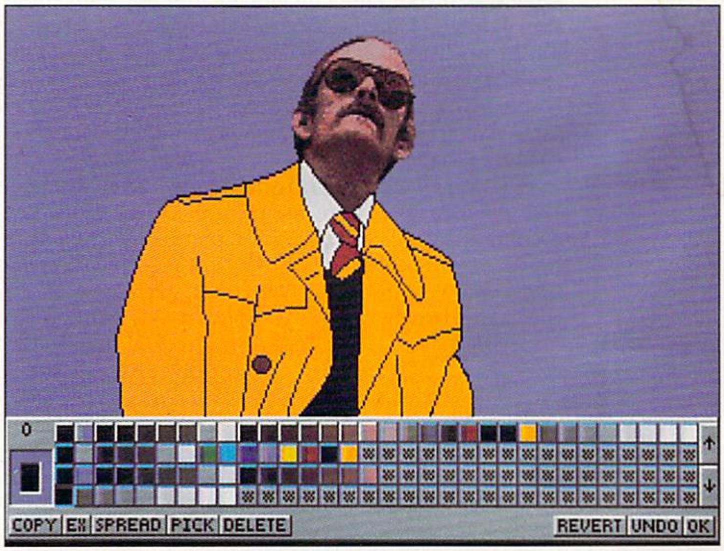


Figure 2. The Arrange register is DeluxePaint IV's "Color Central."

Project #2: Morphing Madness

While DPaint's new Metamorph feature is not a bread-and-butter tool, it is one of the more intriguing additions to the program. You need not look far to find out that morphing is hot. No less than five national television commercials currently use this technique. Different than a fade or dissolve, a metamorphosis is the smooth transformation ►

of one object to another, wherein the original image appears to change shape as if it were made of flowing hot plastic. Perhaps the best illustration is the silvery villain of last summer's hottest special-effects flick, Terminator 2.

Not to be left behind, the wizards at Electronic Arts performed some metamorphosis on DPaint, including a new feature to allow such transitions. It is great fun, but a word of warning: Don't overdo it. Something this good is easy to overuse, but doing so lessens its impact in your finished product. Be selective and use a morph (or any other effect) to advance your story, not just to satisfy a "gee whiz" impulse.

For all its power, the Metamorph tool is simplicity itself. Nevertheless, there are a few tips and at least one trick that you can use to improve your results.

If you examine the Brush menu, you will see a new entry named Spare. This submenu contains three items: Swap, Copy, and Metamorph. Swap and Copy function identically to their big brothers in the Picture menu. This means that you now have a spare buffer for your brushes.

You begin a metamorph by choosing two images to transform. If they are not already brushes, make them so, taking care that the images share the same palette. Keep in mind that the brushes should be nearly the same size. If your target images are radically different in size, simply pick up the same amount of screen real estate for the smaller brush as you do for the larger. For an interesting effect, try locating one image in the lower-right corner of its brush and the other in the upper-left corner—then watch the resulting morph migrate from one corner to the other.

Pick up or load your brushes in any order you like. Use the Brush->Spare menu item or the Alt-n key combination to copy the first picture to the spare buffer. Be sure that the last image of your transformation is the visible brush. If it is not, exchange it with the spare brush using the Brush<->Spare (Alt-b) function. Finally, invoke the Metamorph process from the same menu. A requester will appear, asking you to enter the number of frames you want to use for the morph (indicating many frames produces a smooth effect, but a large file). Clicking on this requester's OK button starts the process.

As DPaint proceeds with the transformation of your brushes, each step is displayed (don't worry, you will get your original screen back when the program is finished). The result is a standard animbrush file that you can save, add to your animation, or discard as you desire.

The Unexpected

Sometimes the morph may not be what you expected. If you try to morph brushes larger than 250 pixels wide in any resolution, for instance, you may be in for a rude surprise. To get around this annoying limitation, divide your brush into equal pieces, morph them separately, and reassemble the results. (You may have to do some touch-up work where the pieces join.)

As another example, morphing two radically different shapes—such as the letter K to the letter G—results in a tearing effect as the angular legs of the K move horizontally to form the round shape of the G. This will happen anytime you try to transform an irregular shape to one that is smoother and rounder. To avoid the tearing, try this: Rotate both brushes 90 degrees by using the z key or the corresponding Brush/Rotate submenu selection, and do the morph again.

Because you cannot use the Rotate function with the resulting animbrush to return the morph to its original orientation, you must create some animation frames, stamp it down to create an ANIM file, and rotate each frame 90 degrees. Preserve the morph's registration by drawing an identically sized and positioned rectangle around each frame's image. Pick up both the rectangle and the image, rotate the brush, and stamp it down, keeping the rectangle's location constant for each frame. Erase the rectangles to complete the process. The results are well worth the effort. (For more on DPaint IV morphing, see Accent on Graphics, Jan. '92, p. 78.)

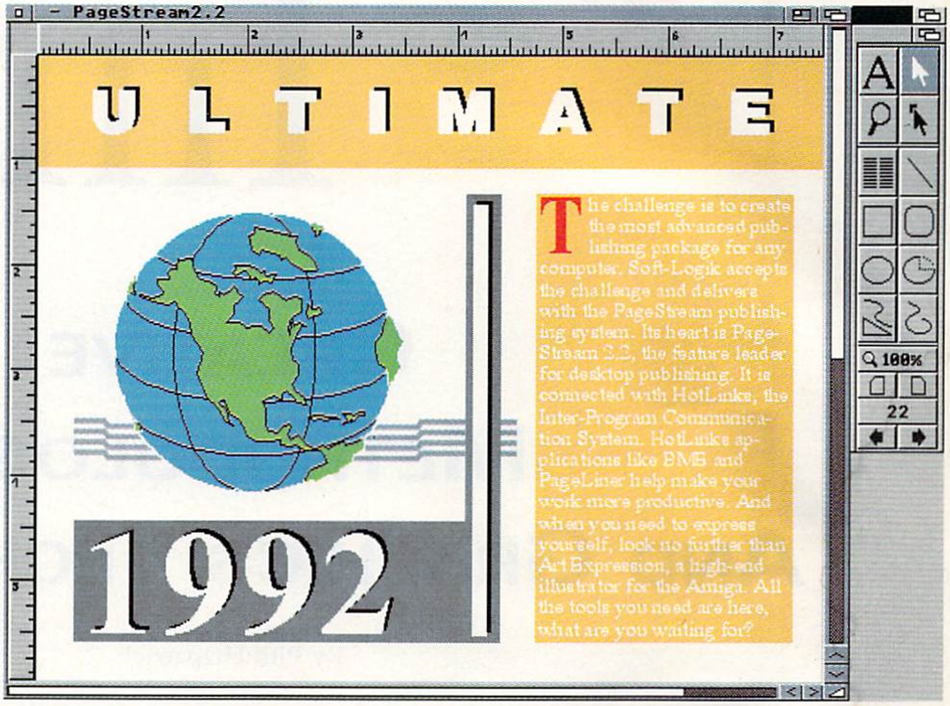
Unfortunately, one article cannot detail all of DPaint's new tools. This is also fortunate, however, because it means DPaint IV offers so much. In future issues, I will cover the uses of such terrific features as the LightTable (great fun for animators, as it lets you see four previous frames—in color—through the current one), plus Translucency, HAM stenciling, and Mix mode (which give you incredible control over your images). In the meanwhile, I am sure that as you experiment with DPaint IV, you will find uses for its new tools that their creators never even imagined. ■



Gene Brawn is a digital animator, graphics designer, and frequent lecturer, as well as a contributing editor to this magazine. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*

More than Skin Deep.

INTERFACE	ProPage 2.1	PageStream 2.2
AmigaDOS windows	N	Y
AmigaDOS gadgets	N	Y
AmigaDOS scrollbars	N	Y
AmigaDOS file requester	N	Y
ENVIRONMENT		
# of Open Documents	1	Unlimited
View Magnifications	7 fixed	15–1500%
Variable Zoom	N	Y
Magnifying Glass Tool	N	Y
"No Frames" Text	N	Y
Moveable Toolbox	N	Y
HotLinks Compatible	N	Y
GRAPHICS		
IFF (24 bit)	Y	Y
ProDraw Clip – Editable?	Y / N	Y / Y
Aegis Draw – Editable?	Y / N	Y / Y
IFF DR2D – Editable?	N / N	Y / Y
EPS – TIFF/PICT preview	Y / N	Y / Y
PC: TIFF, GIF, IMG, GEM	N	Y
Mac: Paint, PICT, TIFF	N	Y
FONTS		
PostScript Type 1	N	Y
PostScript Type 3	N	Y
Compugraphic	Y	Y
Soft-Logik format	N	Y
Outlines on Screen	Y	Y
# Outline Fonts Included	2	18
Typographic Precision	1 pt	0.01 pts
Maximum Size	720 pts	183,000 pts
OUTPUT		
Amiga Preferences	Y	Y
Custom Printer Drivers	N	Y
Print to Disk	Y	Y
LAYOUT		
Templates	Y	Y
Master Pages	N	Y
Maximum Page Size	22x22 in	1200x1200 ft
Paragraph Tags	Y	Y
Snap-to-Grid	Y	Y
Snap-to-Guides	N	Y
Measurement Systems	3	9
TEXT		
Bold, Italics	Y / Y	Y / Y
Underline, Outline	Y / Y	Y / Y
Shadow, Light	N / N	Y / Y
Reverse, Strike-Through	N / N	Y / Y
Import ASCII	Y	Y
Import excellence!	N	Y
Import ProWrite	N	Y
Import WordPerfect	Y	Y



PageStream 2.2 in 16 color mode

The new PageStream 2.2 is a work of art. The first thing you notice is the snazzy new toolbox. But beauty is more than skin deep. A screenshot cannot show you the power of version 2.2. Using a common PageStream system, text speed is improved up to 500% over the previous release. The January issue of AmigaWorld called PageStream 2.1 the Experts' Choice, what will they call PageStream 2.2?

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Amiga Image-

Creative Methodology And Graphics Technology

By Phil Fitzpatrick



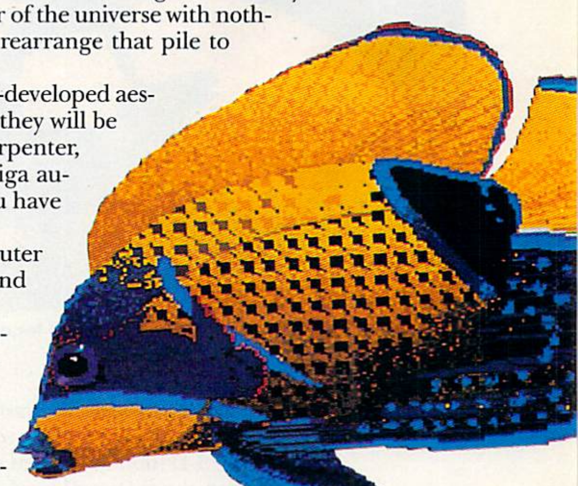
Making

Sometimes we forget the second half of the equation when we say "computer art" or "computer graphics." Whether you use a pencil, a brush, an open can of paint, or an Amiga mouse, you need to understand and to visualize what you want to achieve in making images. The "basics" presented here by a thoughtful teacher and computer artist aren't necessarily just for beginners.

From the moment that first Cro-Magnon grabbed a stick out of the fire and recorded the mysteries of the Neolithic world on the walls of a cave, we have made images to tell our stories, record our history, commemorate our heroes, and enhance the aesthetic quality of our lives. What motivates that kind of activity? Simply this: Human beings are innately and instinctively creative. Set us down in the remotest corner of the universe with nothing more than a pile of sticks and stones, and we will immediately rearrange that pile to make it more interesting to look at.

Arguably, instinctive creativity does not spontaneously include a well-developed aesthetic sense, and the desire to make images does not guarantee that they will be good ones. Just as owning a hammer won't qualify you as a master carpenter, neither does owning a sophisticated graphics computer like the Amiga automatically make you an artist. This does not mean, however, that you have to settle for poor-quality images. In fact, it's just the opposite!

But what does all this philosophical rhetoric have to do with computer graphics? Quite a lot, actually, when you distill it to its essence. You end up with three primary ingredients and a lot of subtle flavorings.



As a computer-graphics instructor, much of my time is spent in discussions of technical how-to—sometimes at the expense of fundamentals that have been around a lot longer than computers. Such ideas, however, are just as important in electronic media as they are in traditional image-making. In any creative endeavor, *perception*, *selection*, and *organization* are the keys to comprehending, extracting, interpreting, and translating your experiences of the world into visual form.

If this sounds like a glossy simplification, it is; but once you understand these fundamental concepts, you can do a great deal to improve the way you create your own images and to make the entire process more challenging for yourself at the same time.

Sign Up and See the World

First, how do we *perceive* the world? Only marginally, I'm afraid. We can only focus our eyes on one thing at a time, so we really get only brief glimpses that our brains construct into the larger concept of "world." Of course, this is supplemented by our other senses, but in spite of the fact that we are all extremely comfortable and familiar with our three-dimensional environment, it's hard for us ►

to fill in the details and reconstruct or "remember" the relationships of objects in three-dimensional space unless we are looking directly at them.

This vagueness makes up the transient feelings, emotions, or impressions that a scene creates in us. To make things worse, our images (drawings, photos, paintings, and so on) are *two-dimensional* abstractions or translations of that 3-D world onto a flat surface. Even the 3-D models created on the computer are presented on the 2-D surface of the monitor.

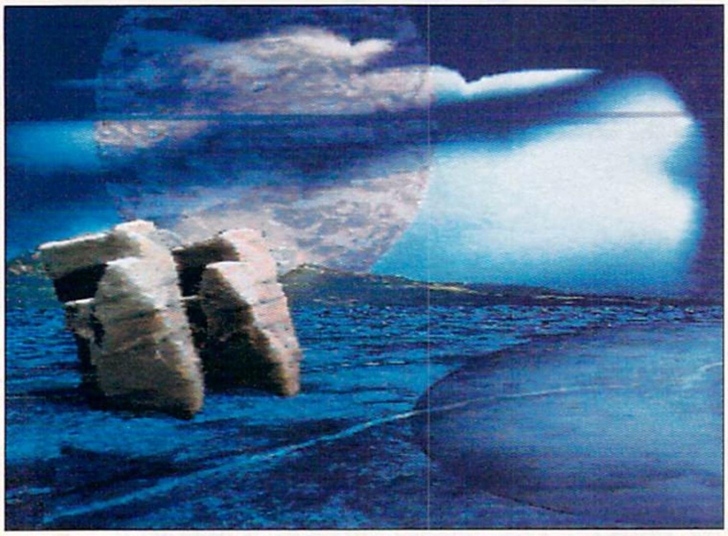


Figure 1. The positioning and size of the elements in your composition can make your images communicate more fully and be more exciting.

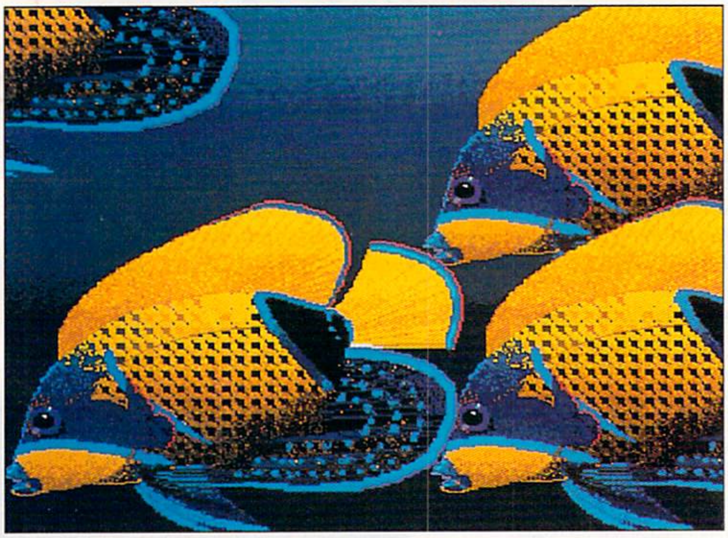


Figure 2. Placing the fish on the diagonal lends a sense of movement.

Real perception comes with understanding the visual clues our brain uses to create its world and learning how to use them effectively. Fortunately, human beings possess complex mechanisms for dealing with abstraction, and these permit us to suspend our disbelief and superimpose our knowledge of reality on these 2-D representations. Some of the mechanisms we use to interpret and translate 3-D "clues" are size, scale, overlap, color, value, and perspective. Visual space (as opposed to real space) is actually a cleverly conceived series of visual lies that uses combinations of these mechanisms to create the illusion of real space.

For the most part, none of these things are strangers. All of us are familiar with the fundamental concepts of perspective. We are aware that objects farther away appear to be smaller, and that parallel lines going off toward the horizon appear to meet. Overlapping objects to suggest distance is one of the first tricks we learn as school children. Color and value tend to be more elusive, but that is a whole can of worms by itself.

You Gotta Be Choosy

Being selective in choosing what to include in an image is sometimes difficult. One of the best ways to begin is to think of storytelling. Select a theme that might evoke an emotional response from your audience (maybe something humorous) or, perhaps, suggest an episode from a story. (This is a trick many illustrators use.) Maybe you could even create your own personal, surrealist fantasy environment like the one in Figure 1.

Remember, however, to keep it simple. Don't try to tell your audience too much at once. Excite their curiosity and tease them into becoming involved in your image. Beginners generally put too much information in a single picture. By selectively showing portions of objects, you can create an illusion of something unseen about to happen. And filter out unnecessary details—leaves on a tree at close range are merely blobs of color at a distance.

Consider the really important factors in what you are trying to show and then adjust your viewpoint accordingly. For example, let's say you are trying to show a sports car and want to communicate a sense of its dynamics and speed. A side view will tell you a lot about the car, but not much else. However, moving your eye to a point not far in front of the headlamp so you are looking at both the front and side simultaneously will create a distorted perspective view with a strong suggestion of movement. Notice in the opening illustration and in figure 2 how the movement is directed diagonally. This positioning reinforces the notion of action; if the fish were horizontal they would appear static.

Organization Is the Key

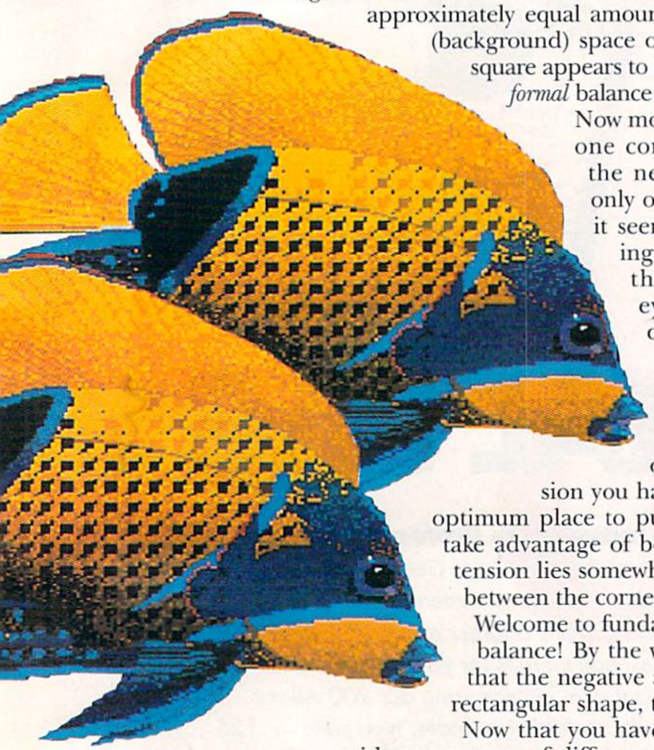
Composition, or *organization*, is probably the most important of the three ingredients in creating dynamic and powerful images that communicate the feelings and concepts you intend. Organization of pictorial space hinges on the notion of visual balance; that is, the arrangement and distribution of elements to combine states of visual tension and stability and create an overall sense of cohesiveness. That's quite a mouthful, so let's translate it into a set of guidelines that make a little more sense. Traditionally, arrangements of objects in pictures have fit into one of two categories:

- Formal, symmetrical arrangements that usually have bilateral symmetry (equal matching, or mirrored, halves). If more than two matching segments exist around a center point, then we use the term "radial" symmetry.
- Informal, asymmetrical arrangements, where objects of unequal size but of equal importance (determined by color, shape, value, texture, or placement) make up the image. For example, a small, brightly colored ►

object can be visually as important as a large, neutrally colored one.

Definitions and theory are great, but how do you decide if you really have succeeded in organizing your picture to make it interesting to look at? Unfortunately, there are no absolutes—this is something that requires subjective judgement and practice on your part.

There are, however, a couple of things you can do to make things clearer. First, boot up your favorite paint program. Then set the background color to something other than black (that way you can see the boundary of the screen). Put a small (about one-inch) square of any color right in the middle of the screen. Notice that there are approximately equal amounts of "negative" (background) space on all sides. The square appears to be at rest. This is *formal* balance at its simplest.



Now move the square to one corner. This time the negative space is only on two sides, and it seems to be "pushing" the square into the corner. Your eye is constantly drawn to the unstable corner at the expense of the rest of the space because of the visual tension you have created. The optimum place to put the square to take advantage of both balance and tension lies somewhere along a line between the corner and the center. Welcome to fundamental *informal* balance! By the way, don't forget that the negative area is just a big rectangular shape, too.

Now that you have the idea, try it with two squares of different sizes and colors and then add other shapes. Change the relative positions and distances of the shapes and notice, as they move, the visual tension that is created or lost in the process. Try adding textures to make it more interesting. If you try these simple exercises, I think you will be surprised at how quickly your awareness and sensitivity to these relationships increases.

On to the Big Picture!

Now let's see how all this works! Figure 1 incorporates most of the principles described, but a step-by-step tour will help tidy up any loose ends. First, the picture plane (for our purposes, the monitor screen), which defines the boundaries of the image, is divided into unequal sections by the horizon. This avoids any monotony caused by splitting it at the middle and leaving it in two equal parts.

While the term "lines of force" may sound like something from a sci-fi novel, the concept is important and actually refers to a visual trick used to direct, or "force," the eye to follow a path around the surface of a picture. To take advantage of the trick, I rotated the ground plane to the left to create a directional movement toward—but not smack in the middle of—the horizon. I added the two stones to appeal to my sense of mystery, but also to redirect the eye up to the clouds drifting across the sky, leading away from the left side of the picture until the eye eventually follows the curve of the clouds down the right side to the ground. The large, partly visible spheroid points back to the left across the ground plane, pushing the eye back up into the picture.

The result is that the viewer looks all over the surface of the picture, but is constantly pulled back in, never wandering out of it. All of this explanation may seem a bit melodramatic, but the point is that by carefully thinking out where things are placed and what sizes they should be, you can develop the means to make your images communicate more fully and be more exciting to look at. Each of the parts in Figure 1 is carefully positioned relative to the others. Cover one up, and the arrangement of the rest no longer functions.

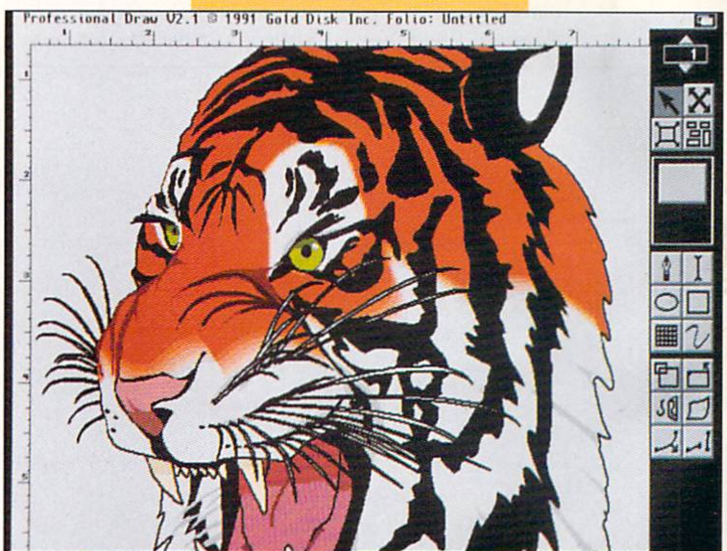
In conclusion, let me leave you with a few observations, hints, and tips:

1. Depending on a single software package not only severely limits what you can expect to accomplish, but it often gets in the way of paying attention to the important design concepts. It is true that familiarity with the tools is essential to being productive, but each paint or modeling program has its own strengths and weaknesses. Take advantage of the best parts of each and don't hesitate to mix and match.
2. Try not to "over-think" your ideas before you actually begin working. A strong preconception can be a death sentence if you are unwilling to adapt to needed changes; if it becomes an unattainable goal, the image—no matter how hard you try—will never quite turn out right.
3. When you are creating something new, don't automatically stick it in the middle of the screen. Doing so is not necessarily wrong, but it is better to think about the whole picture, not just the parts. And don't let the edges intimidate you.
4. Look carefully at everything you see around you. Pay attention to how pictures in magazines are composed and see what gimmicks the Sunday comics use to punch their point across. When taking photographs, stop a second and think about what you see in the viewfinder. What works with a camera also works with a computer.
5. Try to remember your impressions of things you have seen, because the quality of what you remember frequently makes a better picture or story than the real thing.
6. If you have access to some books on basic design principles, read them. As most design books have examples and problems to solve, you can add to what you know while you try them out on the Amiga! Remember, there is no one right way to make a picture, but there are right choices that can make it better! ■

Phil Fitzpatrick teaches art—including Amiga graphics—at Lamar University in Beaumont, Texas. His background is in commercial design and advertising. Write to him c/o AmigaWorld, *Editorial, 80 Elm St., Peterborough, NH 03458.*

The Painter's Guide to Structured Drawing

Structured-drawing programs can add valuable new tools to the creative arsenals of artists and desktop publishers alike. This tutorial on structured drawing—with comparative evaluations of three leading programs—will show you the way.



There are two distinctively different ways of designing or creating art on a computer: structured drawing and bitmapped painting. Knowing the particular advantages and disadvantages of each method can add substantially to the repertoire of both painters and publishers. While this article deals mainly with structured drawing, it will compare the differences between the two methods and also point out instances where both techniques can be combined successfully. Take the first part of this article as a bitmapped painter's introductory guide to structured drawing.

In the second part, I will examine three leading Amiga structured-drawing packages: **Professional Draw 2.1**, **ProVector 2.1**, and **DesignWorks**. Although I will, of course, compare their features and evaluate their relative strengths and weaknesses, I intend such comparisons mainly to illustrate further how these programs—and structured drawing in general—can be used to enhance painting and publishing processes on the Amiga.

Structured-Drawing Methodology

JUST WHAT IS the difference between a paint program and a drawing program? By way of analogy, compare it to the difference between painting on paper with a paint brush and drawing with ruler and compass.

In computer terms, with a bitmapped paint program such as DeluxePaint (Electronic Arts), all the drawing tools modify a bitmapped area of the computer's screen memory. What that means in plain English is that your pictures are made up of hundreds or even millions of pixels arranged in a two-dimensional grid where each pixel can be painted one of several colors selected from a color palette.

When you use a paint program, drawing a line in red between two points colors all the pixels between them; in fact, all paint operations affect several individual pixels. This means that a filled circle is not just a shape with a certain radius, but an area composed of several colored pixels.

Drawing a red line with a structured-drawing program is something entirely different. Instead of modifying numerous pixels, you are only defining the coordinates of the two end points, specifying the color you wish to use, and stating that you are drawing a line. In practical terms, this means that the structured line is device-independent, because the computer remembers only the coordinates and the attributes of the line.

When you print this line to a laser printer, for ex- ►

By Eyo Sama

ample, the line is printed using the high resolution of that printer. A bitmapped line, on the other hand, is always composed of the number of pixels it was drawn with, and it therefore often looks the same whether it is printed with a 300-dpi (dot-per-inch) or a 1200-dpi printer.

Bitmapped paintings also frequently exhibit "jaggies" (unwanted jagged edges), depending on the resolution and scale at which they are reproduced. Of course, if you use your paint program at its highest screen resolution, you can sometimes avoid these problems. Unfortunately, higher resolutions on the Amiga also mean fewer colors. What Amiga bitmapped painters really need is to have programs such as DeluxePaint work on the new 24-bit (16-million color) graphics cards.

Like the lines described above, the computer remembers other structured objects in a similar fashion: A circle is composed of the coordinates of its center, its x and y radii, and its attributes (line weight, color, filled/not filled, and so forth); a curve (Bezier curve) is defined by four sets of coordinates and the attributes of the curves. There is another, on-screen advantage to the way structured art is represented. Because only coordinates and attributes are remembered, lines and curves in a structured drawing are always smooth, even if you zoom down to the highest magnification your program allows.

Structured drawing and bitmapped painting go hand in hand when it comes to the desktop-publishing process.

"Structured" Flexibility

One of the major advantages to working with a structured-drawing program is that objects in a structured drawing can be modified. For example, if you draw a green line from one point to another, you can always pick up either end point and move it to a different position, or you can change the color of the line. Similarly, you can modify the shape of a Bezier curve by either moving its end-points or by moving one of its two control points. To do the same in a paint program, you have to erase all the pixels of the line or curve, and then redraw it in the desired new position.

Drawing an object in a paint program always erases whatever is behind the object, because everything exists in one layer. All structured objects, on the other hand, exist in their own layers; therefore, drawing a horse in front of a tree does not erase the obscured parts of the tree. In addition, you can pick up the horse and move it to a different location without having to re-create parts of either the tree or the horse. You can also rotate the horse or skew its shape without affecting the smoothness of the object.

Documents containing structured artwork usually print faster than those containing bitmapped artwork, especially if the structured artwork is not very complex. However, a very complex structured drawing containing several blends, graduated fills (color shading), and multiple objects may take quite a long time to output to a PostScript printer; it also uses a vast amount of the printer's memory.

All of this sounds as if there is no need for bitmapped paint programs at all. That is not the case, of course, because there are many things that are just not feasible to do with a structured-drawing program. Although it is possible to create the effects of shading with a structured-drawing program by using multiple objects and several shades of color, you simply cannot produce the subtle variations in shading you can achieve with a paint program.

Because you have control over every single pixel of your painting, a paint program allows you to work in great detail. In DeluxePaint IV, for example, there are tools enabling you to smear colors, to use tinting and transparency, and generally to manipulate your painting in ways not achievable with any structured-drawing program—be it Amiga-based or otherwise. Don't forget, a bitmapped paint program also allows you to modify scanned or digitized images, which you can then combine with your own painting.

Structured Drawing and DTP

As far as desktop publishing is concerned, the choice between using a paint program or a structured drawing program does not really exist; you need to be able to use both. Often you will find yourself using a combination of bitmapped and structured art in many of your publishing projects.

Most structured-drawing programs allow you to edit and manipulate the outlines of text characters. This particular feature is one I use most often, as it allows you to create very impressive headings consisting of skewed, rotated, patterned, graduated, and otherwise enhanced text. You can create 3-D effects on text using these tools, too. Producing realistic-looking shadows is also possible, and, in fact, is simple to do.

A structured-drawing program is also handy for creating very simple illustrations that you can use to enhance the look of some documents. For example, if you are designing a valentine card, it is easy to draw a small heart using two Bezier curves in a structured-drawing program and then to use multiple copies of it—in various sizes—to illustrate the card.

With a bitmapped paint program, you would have to draw multiple hearts (for the different sizes) or use a single heart in either low or high resolution. If you use a low-resolution heart, you will get jaggies whenever the heart is scaled up, but the page will print fast. If you use a high-resolution heart, you may be able to avoid the jaggies, but the page will take forever to print if you have multiple hearts. In situations like this, the structured-drawing program is the way to go. ►



LEANDER

Thanatos lurks in his lair, bathing in the power-giving life-force he is sucking from Princess Lucanna.

Princess Lucanna is dying: Imprisoned in the Sphere of Depletion her strength will soon be gone.

Meanwhile, Leander – Captain Of The Guards – kneels before his master seeking advice. He is told: *The princess is the balance between good and evil, if she dies, good dies and evil shall engulf the land.*

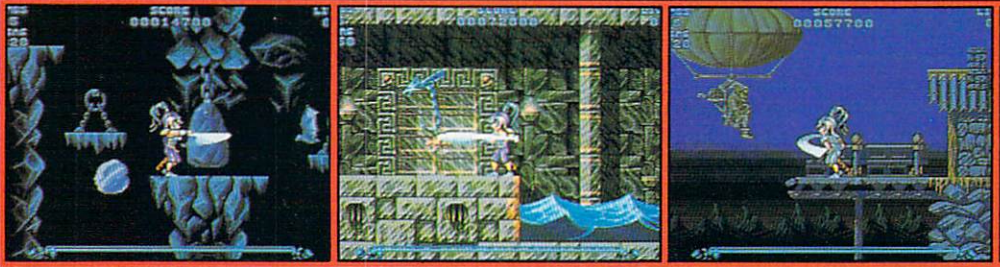
As Thanatos' power grows, the world succumbs to his evil grasp; Leander now has to face and conquer dangers beyond his darkest dreams before he can free the princess and save the land.

*You play the part of the Princess as she hangs around inside the Sphere Of Depletion waiting for Leander to rescue her. Will he make it?
Or will you spend the entire game doing nothing but having your life-force sucked?

Leander: Where heroes Sphere to tread!

*Psygnosis reserve the right to amend this storyline.

Screen Shots from the Amiga version.





BARBARIAN II

Necron's back in town and he wants revenge. Only you – in the guise of Hegor the Barbarian – have the courage, strength and stupidity to face the challenge:

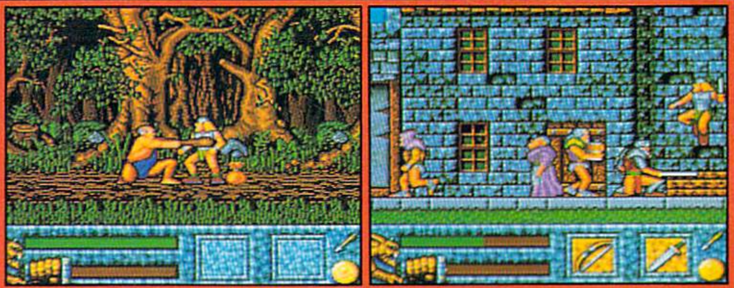
It's time once again to don your dented hemlet, tie your sweaty breechcloth, sharpen your rusting sword and move your big feet in the direction of danger.

Forests, caves, dungeons, castles and temples await your barbaric exploration, each is infested with deadly inhabitants and devious traps ready to terminate your lowbrow activities.

Featuring 2,000 frames of sprite animation, 32 colours on-screen, parallax scrolling, 6 levels of continuous arcade/adventure action, over 1 megabyte of fully-animated sprites, 50 divergent enemies, Magic & Health Potions to help you on your quest and a plethora of unique weapons to find and use. **Barbarian II** is:

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Screen Shots from the Amiga version





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A structured-drawing program is also the perfect tool to use when you are trying to draw impressive three-dimensional charts and graphs, especially since you can add rotated and enhanced text. Again, because of the problems with jagged edges, a paint program is unsuited for such work. In general, text created within a paint program looks fairly shabby when output, while text from a structured-drawing program is always drawn at the resolution to which the printer has been set.

Combining Structured and Bitmapped Art

Sometimes it is advantageous to combine elements of both structured and bitmapped art to create an illustration. This allows you to use each form of computer art to its best advantage. For example, say you are designing a postcard and have a beautiful bitmapped painting of dolphins, parrots, water, and palm trees, and you want to add some fancy text to your card. It is best to use a structured-drawing program to add the text; you could perhaps even design the text characters in the shape of palm trees, or dot the i's with a structured drawing of a hat.

In many of today's magazines, you will often see blocks of smooth color graduations. With a structured-drawing program, you can achieve this by using either the blend tool or graduated-fill feature in your software (if available). I use a trick that will give you beautifully smooth graduations using bitmapped objects instead of structured ones. Using the Backdrop loader in Art Department Professional (ASDG), I create a graduated (and dithered) 24-bit bitmap that is only 16 pixels wide, but several hundreds tall. Whenever I want to use a smooth graduation, I import the bitmap into either my layout software or into my structured-drawing program and resize it to the shape I require.

The resulting color graduation prints very fast because the bitmap is only 16 pixels wide, and it is smooth because it not only uses several shades of color for the graduation but it also dithers these colors—thereby effectively increasing the range of colors. Because PostScript printers—and color printers in general—have a limitation of 256 shades for any color, doing these kinds of graduations is not really possible with a structured-drawing program. To get the maximum benefit from publishing on desktop, it is a good idea to combine the use of both structured drawing and bitmapped painting programs.

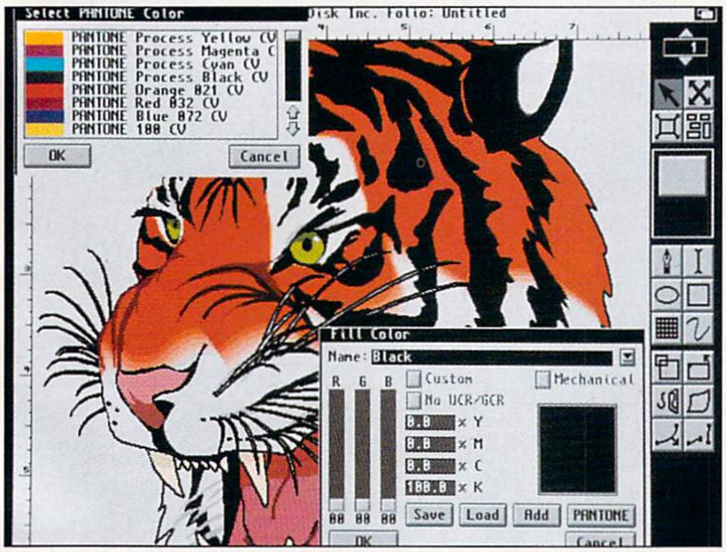


Figure 1. Professional Draw 2.1 is the only structured-drawing program that supports The Pantone Color Matching System (PMS).

Structured-Drawing Programs

LET'S NOW TAKE a look at three leading contenders in the Amiga structured-drawing arena and compare the kinds of things each one does best to help you see which one might most closely suit your needs.

Professional Draw 2.1

Gold Disk's **Professional Draw 2.1** ($199.95) is aimed at the professional and amateur desktop publisher. First announced as a companion program to the company's page-layout software, Professional Page, it is now also regarded as a stand-alone illustration package. Other layout software, such as Soft Logik's PageStream and Saxon Industries' Saxon Publisher, can also import Professional Draw illustrations, although only Professional Page and PageStream show the actual illustration on screen. PageStream even allows you to edit the illustrations.

Of the three structured-drawing programs covered here, only Professional Draw supports PMS (Pantone Color Matching System), the color-printing standard of the publishing and printing industries.

Professional Draw's features include dithered colors, gradient fills, compound objects, and the ability to import bitmapped images, to blend one object into another, and to warp objects to obtain 3-D effects, among several others. You can add text to illustrations, and because the font outlines are fully editable, you can make the text a part of the illustration. You can apply gradient fills to text characters and make lines of text fit the shape of a curve.

Professional Draw will print to any device/printer that supports PostScript, even color PostScript. It will also print to any Preferences-selectable dot-matrix printer or to HPGL-compatible (Hewlett-Packard Graphics Language) sign-cutting machines.

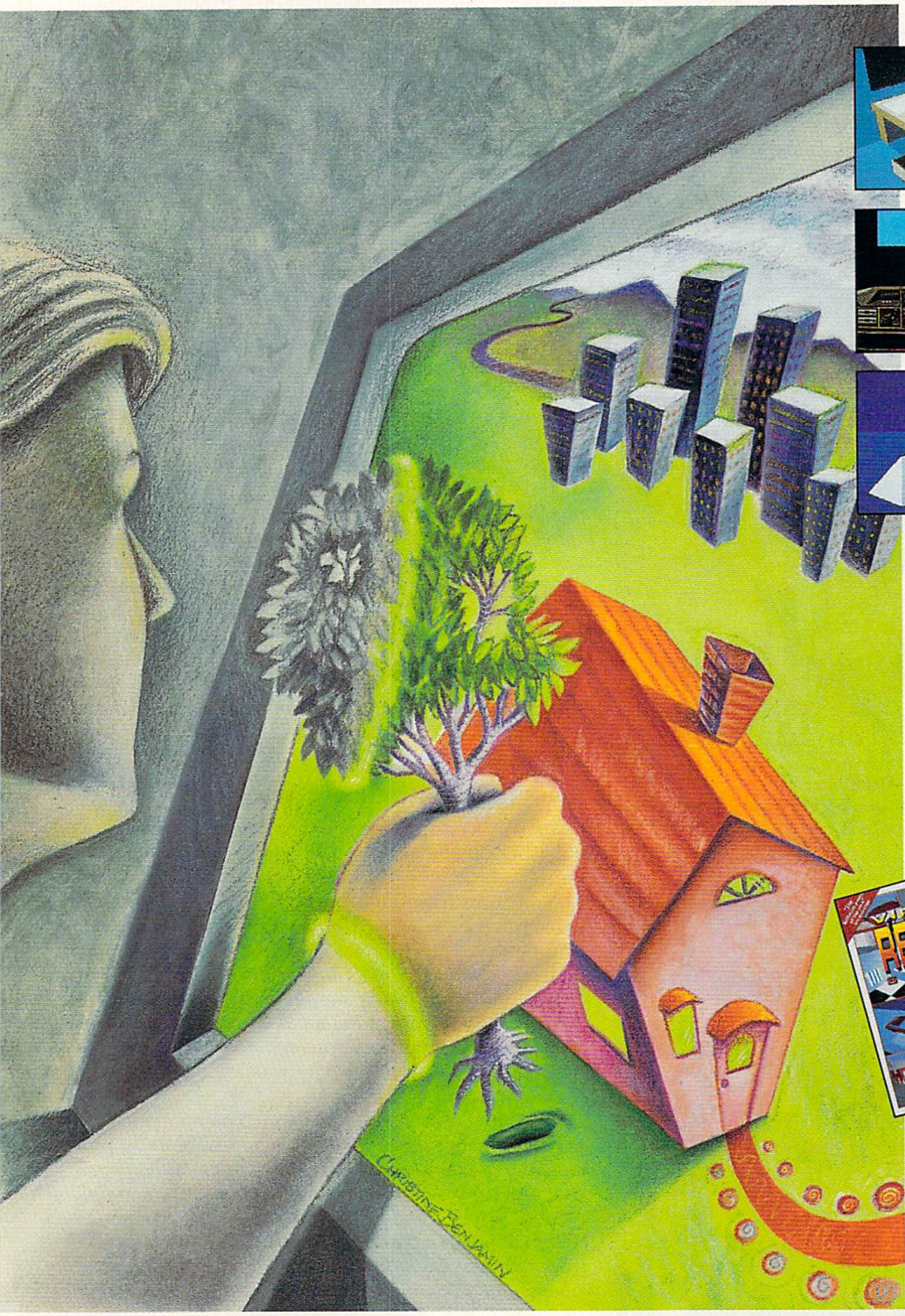
Anyone familiar with using illustration software (such as Adobe Illustrator or Aldus FreeHand) on other platforms will be comfortable using the interface and drawing tools of Professional Draw.

ProVector 2.1

Stylus' **ProVector 2.1** ($299.95) is a feature-filled structured-drawing program, again aimed at both the professional and amateur desktop publisher. Only PageStream and Saxon Publisher will directly import ProVector's illustrations; Professional Page can only import them as Encapsulated PostScript (EPS) files.

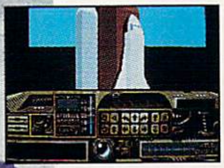
What I find impressive about ProVector is the way it can simulate multiple colors by dithering whatever number of colors you make available to it. The dithering is coarse, but even an eight-color Workbench screen is sufficient for ProVector to produce several additional colors. ProVector is also the only one of these three programs that supports ARexx. With ARexx, you can write code to link an ARexx-supporting spreadsheet program to ProVector, thereby letting the ARexx program use the spreadsheet data to automatically create fancy 3-D graphics ►

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with ProVector. This is a very powerful feature, and I would like to see developers take advantage of it more fully.

Another handy ProVector feature is the ability to draw with multiple layers, each being individually selectable. ProVector prints to PostScript printers, Preferences-selected printers, and HPGL-compatible devices. It can also output illustrations as IFF images.

Like Professional Draw, ProVector has tools that allow you to scale, rotate, duplicate, and group structured objects. You can load bitmapped images and combine them with structured art. Although it has many professional features and abilities, I find its interface and drawing tools to be rather nonstandard as far as structured-drawing software is concerned. Especially weak is Bezier drawing, which should be the most important tool in any structured-drawing program. With a little spit and polish, this program could become a formidable contender.

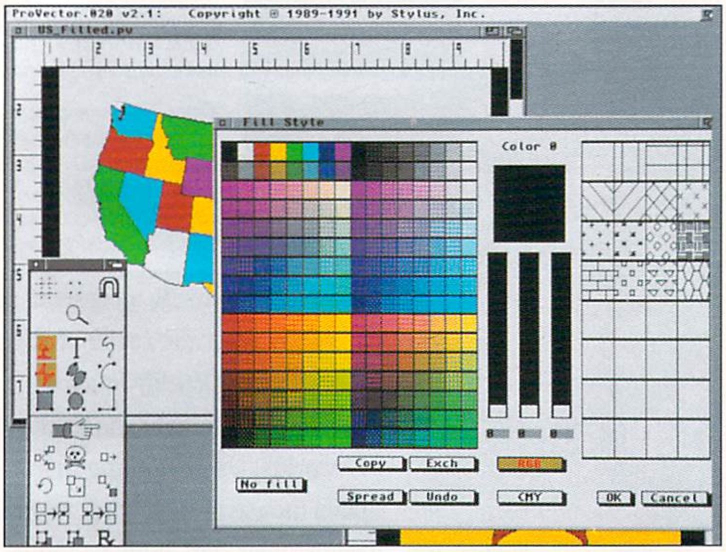


Figure 2. ProVector 2.1 can simulate multiple colors by dithering whatever number of colors you make available to it.

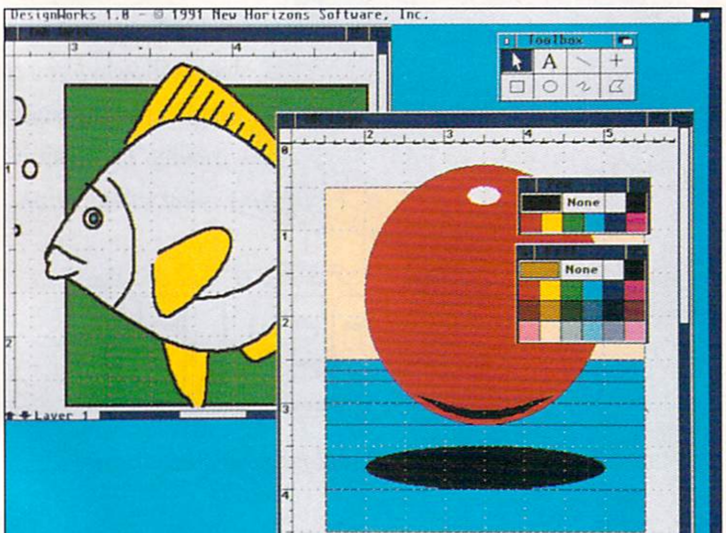


Figure 3. The less-sophisticated (and less-expensive) DesignWorks still allows you to work on multiple-layer drawings.

DESIGNWORKS

New Horizons' **DesignWorks** ($125) is an entry-level structured drawing program suitable for users who wish to produce simple illustrations for their word-processing software. Inexpensively priced, DesignWorks is not meant to be an alternative to the other two programs, but it can still be useful if you do not require their powerful features.

The drawing tools are simple to use, but basic in operation; for example, there is no Bezier drawing tool. You can draw curves with the freehand tool or create them by smoothing polygons; movable Bezier control points become available once you have drawn the object. The interface is easy to learn, even without glancing at the well-written manual, and it follows the conventions used by structured-drawing programs available on other computer platforms.

Like ProVector, DesignWorks also lets you work on multiple drawing layers. There are tools to scale, rotate, flip, and clone objects. You can perform rotations, however, only in 90-degree increments. DesignWorks also supports ARexx, which extends the capabilities of this program. For instance, it might prove interesting to send data from a spreadsheet to DesignWorks, have it produce a 3-D bar graph, and then send the graph to New Horizons' ProWrite to be included in a document.

As of this writing, I know of no software, other than the newest version of ProWrite (3.2), that will import DesignWorks illustrations in its structured-drawing format. Other layout and paint software can import DesignWorks illustrations if they have been saved as bitmapped images, but this negates the advantages of structured illustrations in the first place. DesignWorks does not support PostScript or HPGL printing, but it will output to any Preferences-selectable printer.

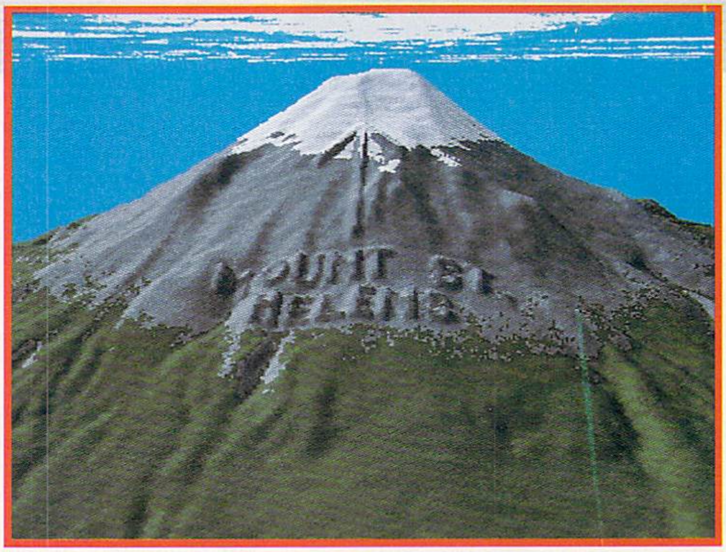
STRUCTURED-DRAWING SUMMARY

DesignWorks is not aimed at the professional desktop publisher, but it may be useful to those who are not power users. ProVector still needs some improvement, especially in its handling of drawing tools, but it is a capable program, and its ARexx support greatly extends its usefulness. Professional Draw may not match some of the capabilities of such programs as Adobe Illustrator 3.0 or Aldus FreeHand running on the Macintosh, but it comes close, and in a few areas even surpasses them. As far as the Amiga is concerned, it is still considered the structured-drawing program of choice for Amiga desktop publishers.

Structured drawing and bitmapped painting go hand in hand when it comes to the desktop-publishing process. When you are trying to determine which type of program to use, consider what is most important to you: printing speed, ease of creation, output quality, level of detail, range of colors, and so on. These factors are always different for various projects, so it is wise to consider them all each time you embark on illustration. ■

Eyo Sama is the former publisher of Amigo Times, *a full-color magazine created entirely on the Amiga. He currently does consulting work for publishing houses and is writing a book and developing software. Write to him c/o* AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03468.*

LANDSCAPING IN *Cyberspace*



Combining paint-program techniques with the operations of a new breed of landscape-generating programs can lead to some very exciting and imaginative creations.

By Joel Hagen

As an astronomical artist spending much of my time painting planetary surfaces, I have always had a keen interest in computer-generated landscapes. In 1977, I saw my first examples of realistic computer landscapes in Benoit Mandelbrot's classic, *Fractals: Form, Chance and Dimension*. In that work, Mandelbrot and Richard Voss used algorithms based on fractal mathematics to produce computer-generated hillsides and islands that were astonishingly naturalistic in form.

Until recently, implementation of related graphic techniques on personal computers has been limited and simplistic. Thankfully that has changed. A growing number of Amiga products can put remarkable capabilities in your hands. It is now possible to create realistic, fractal-based random landscapes, to generate real-world landscapes based on US Geological Survey (USGS) data, and even to paint aerial maps by hand to be generated as full three-dimensional landscapes. This latter process will be our focus here as we explore techniques through which the artist can collaborate with the Amiga, building landscapes in cyberspace.

Landscape Generators: Fantasy and Reality

Currently, the two leading landscape-rendering programs are **Vista Pro** ($149.95, ***Virtual Reality Laboratories***) and **Scenery Animator** ($99.95, ***Natural Graphics***). (For a review of Vista Pro, see Jul. '91, p. 15; for Scenery Animator, see Dec. '91, p. 20.) Both programs can load or create landscape information in the form of Digital Elevation Map (DEM) files, such as those based on USGS data. This DEM data appears as an aerial topographic map on the user-interface screen. On that map, a "camera" can be positioned and adjusted to "take a picture" of a portion of the landscape. That computer-rendered picture is a naturalistic view of a three-dimensional illuminated landscape, with shadows, tree lines, snow, and lakes. Both programs allow you to plot a path on the map to be rendered as an animation. ►

Vista Pro and Scenery Animator are both excellent programs, each having a slightly different interface philosophy, rendering style, and set of controls. Vista Pro can create rivers, Scenery Animator, clouds. Vista Pro includes more controls for such things as smoothing landscape data and adjusting haze and pixel dithering. Scenery Animator has more powerful built-in animation controls.

Both programs save images in low and high resolution, interlace and noninterlace, and overscan and nonoverscan. Vista Pro supports 16-color, 32-color, HAM, and IFF24 output, and it can also save files in Sculpt and Turbo formats. Scenery Animator supports 16-color, 32-color, DCTV, IFF24, and PCX output. *(To contact the developers of these and other programs mentioned in this article, consult the "Manufacturers'/Distributors' Addresses" list on p. 112.)*

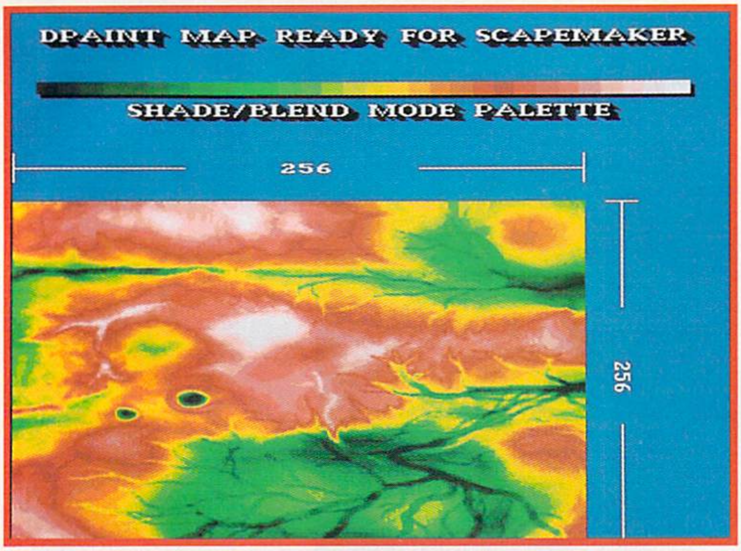


Figure 1. An aerial-map view—painted in DeluxePaint—that will be rendered later as a landscape in Figure 4.

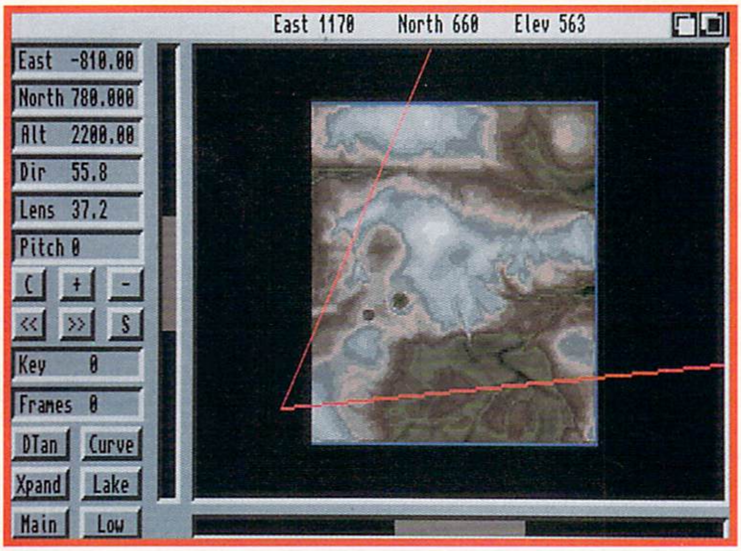


Figure 2. The painting in Figure 1 now converted to a DEM file and loaded into Scenery Animator.

Landscapes are rendered as a net of triangles, colored and shaded to give the appearance of a solid, natural surface. In the distance these triangles vanish, but up close they can appear large and distracting. Vista Pro provides a rendering option employing Gouraud shading to smooth the look of the landscape. This solves the distracting near-triangle problem by giving an interesting painted look to the landscape. Scenery Animator solves the near-triangle problem with a "Detail" button that breaks up large triangles close to the camera into tiny ones to add close-up surface detail where needed. This is one of my favorite features.

If these two programs produced identical images from the same data, I might choose just one and put the other away. Interestingly, they have remarkably individual rendering styles. Scenery Animator produces very smooth landscapes, excelling at rendering nearby terrain and realistic clouds. Vista Pro has a nice craggy look to it, wonderful control of atmospheric haze and color, and an interesting way of distributing vegetation up into valleys. I use both programs extensively.

Included with both programs (with more available at an additional cost) are disks of USGS DEM data files of an extremely wide variety of places, such as the Grand Canyon, Yosemite, the surface of Mars, and many more. Both programs also include fractal landscape generators that can produce DEM files. Instead of accepting real-world topographical data like the USGS files to create landscapes, fractal generators create naturalistic landscapes solely through internal computation based on random-number "seeds." Another source for DEM files is the program **Fractal Pro** ($89.95, ***MegageM***, reviewed Mar. '91, p. 18), which can save Mandelbrot and other fractal sets as DEM files to be rendered as landscapes.

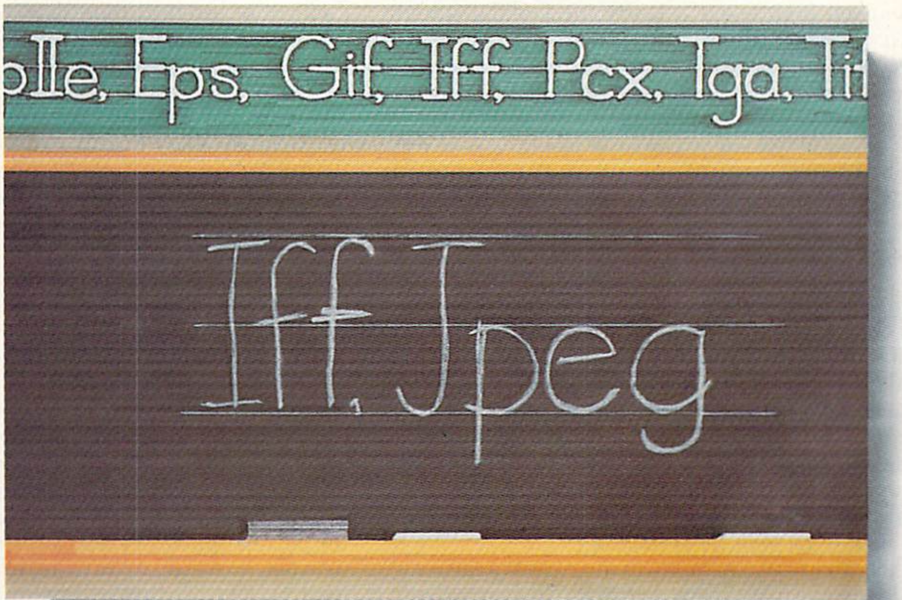
While converting mathematical structures into landscapes is an interesting prospect, what excites me most is painting and editing DEM files from scratch to build my own landscapes. The foundation of this process rests on a great little program called **ScapeMaker 2.0** ($39.95, ***MegageM***). ScapeMaker loads any standard IFF image, including HAM, and translates it into DEM format to be rendered in Vista Pro or Scenery Animator as though it were a landscape file. The different colors of the image represent different elevations.

GET OUT YOUR BRUSHES

What I call the Shade and Blend technique in DeluxePaint (see "Accent on Graphics," #9, Nov. '89, p. 74, and the unofficial first part of this article, "Around the World in 80 Frames," Oct. '91, p. 39) is an ideal way to quickly paint detailed aerial-map views that can later be rendered as landscapes. The painting method is unique to DPaint. Unfortunately, **DeluxePaint IV** ($179.95, ***Electronic Arts***) slows down some processes so much that this particular technique is virtually crippled, so don't throw out DPaint III when you upgrade.

Start on a low-resolution 320×200 screen and set up a smooth 32-color sequence in your palette. I usually leave the first two palette positions as contrasting menu colors for readability. The remaining colors can be any that you like, but for clarity they should ramp smoothly through colors and values as shown in Figure 1. When using ScapeMaker to convert the picture into DEM data, we will use an option that treats each successive palette position as a higher elevation. Color 0 will be ►

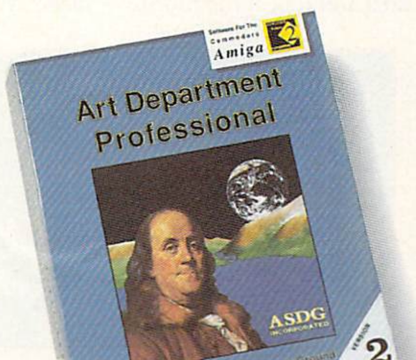
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level 0, color 1 will be level 1, and so on. Thus, in this method, the actual colors we paint do not matter; their position in the palette does.

When the palette is finished, set Range number 1 to include all 32 colors. Return to the main screen and clear to color 0. Select Shade mode (F5) from the menu, and begin painting with a round brush the size of a silver dollar, using the Dotted-Line tool.

In Shade mode, one button causes colors under the brush to move up the palette; the other button causes colors under the brush to move down the palette. Think of yourself high above a landscape looking straight down. One button raises elevations, the other lowers them. Scrub the large brush around the screen until you have some interesting high and low points. Use smaller and smaller brushes to refine the detail, adding valleys, carving coastlines, and so on as in Figure 1.

When you have painted a good rough map in Shade mode, press the F6 key to switch to Blend. Use a 1-inch round brush and the Dotted-Line tool to push the colors around. Painting with Blend will smooth out abrupt elevation transitions, pull regions of low elevation deeper into higher elevations, and so on. Switch back and forth between Shade and Blend using large and small brushes until the aerial landscape is complete.

With a little practice, it is easy to see which areas will be steep slopes and which will be shallow. For example, if an area of color 4 in the landscape is right next to an area of color 26, there will be a very steep cliff. Repeated passes over that color border with a Blend brush will interpose bands of intermediate colors that will reduce the severity of the slope.

I have found that it improves the natural appearance of a landscape to do a final agitation of the entire painting with a 3-inch round Blend brush before saving the image. Place the large brush over an area of the picture, hold down the left mouse button, and jiggle the brush back and forth about a quarter of an inch in both directions. Move to a new area and repeat the process until the entire map has been affected by your "cyberquakes." This subtle agitation has little effect on the structure and detail you have created, but it does eliminate stray pixels, unnaturally abrupt color changes, and accidentally sharp lines in the map that could spoil the final rendering with spikes and walls. Save your finished image.

This painting technique is incredibly fast. From the time I boot DPaint, it takes less than ten minutes to build a logical palette and to complete an aerial landscape like Figure 1. Later in the article, I will address a more advanced method that compensates for pixel aspect ratios, but for now, let's move on to creating a DEM file from the painting.

MAKING THE CONVERSION

While ScapeMaker is a bit rough-hewn, it is inexpensive, unique, and gets the job done. It is the only program I know of that will convert IFF pictures into DEM files. Run ScapeMaker 2.0 from its Workbench icon or from the CLI.

A few simple menu-bar controls and a screen window constitute the interface. From the menu, select Open Image to load the aerial map just saved. It can be seen briefly as it loads to a screen in the background. From the Controls submenu, select Color Number. This mode uses the numbers of the palette positions as described earlier to assign elevations. The Color Value option computes elevations from the RGB values of each color, but I find those results less predictable.

From the Controls submenu, select Scale Factor. At the default setting of 1, the landscape will have very little relief, the lowest point being level 1 and the highest, level 31. The landscape will become more interesting if its elevation increments are scaled up by a factor of 5, 10, or 20. Scale factors up to 99 may be entered, but beware of exaggerating the steepness of the landscape.

Set the Scape Area by selecting that option from the menu. A window appears on the screen with the painting. ►



Figure 3. This sequence shows a flyby of the landscape painting as rendered from a higher altitude in Vista Pro.

A few words about **ProVector**™, the professional illustrator's choice...



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Any questions?

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All illustrations were created with ProVector 2.1, then imported into Saxon Publisher 1.1 to create this ad. Registered owners of ProVector 2.0, be sure to contact Stylus, Inc. for upgrade information, you'll find a tremendous number of additional features and functions in ProVector 2.1 over previous versions. ProVector is a trademark of Stylus, Inc., Saxon Publisher is a registered trademark of Saxon Industries, Amiga is a registered trademark of Commodore-Amiga, Inc.

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This window can be sized up to a maximum dimension of 258×258 pixels and positioned anywhere on the image. When you are satisfied, click on the Close gadget at the upper-left corner of the window and return to the menu.

Select Grab Scape to convert the area under the window into a DEM file. I always perform a smoothing pass before rendering—either in ScapeMaker or Vista Pro.



Figure 4. The finished rendering of the landscape from the point of view shown on the map screen.



Figure 5. The same landscape as in Figure 4, with the addition of craters created with TerraForm's Nuke button.

This removes the otherwise "terraced" look from the final landscape. This is particularly important in painted maps. All illustrations in this article were smoothed. Save the DEM file and quit the program. ScapeMaker has other options, but, for now, let's move along.

Prepare to Render

You can load the DEM file just created into either Vista Pro or Scenery Animator for final rendering. Figure 2 shows the DEM file loaded into Scenery Animator. (For a discussion of Vista Pro's interface, see "Accent on Graphics," #31, Sep. '91, p. 59.) You can see how effectively the original painting translates into an elevation map. Notice that my painted aerial view appears compressed in the north-south dimension compared with the image on the map screen. This was done on purpose to compensate for the pixel aspect-ratio problem.

Scenery Animator's main screen contains buttons for various settings, an image-preview window, and a camera-positioning window. This map screen has position controls, animation buttons, and a great interactive camera-view gadget. Clicking the left button anywhere on the map sets the camera location. Holding down the right mouse button, you can rotate the camera and adjust the field of view by moving the mouse. Returning to the main screen, a click of the mouse in the preview window sets the target for the camera and recenters the image.

Buttons on the main screen allow adjustment of light angle and direction, water and waves, cloud height and density, timberline, snow levels, and other factors that can dramatically affect the look of the finished rendering. Scenery Animator can render single images as well as animations. Pressing the Render button switches the view to a screen upon which the image is painted, line by line. Figure 4 shows a finished landscape rendered by Scenery Animator from the position shown on the map screen. The image is in 320×400 32-color mode, with palette colors adjusted after rendering.

For the first time, we see the results of this collaboration with the computer. A web of valleys, cut with a small Shade brush, stretches out toward the mountains. Clearly visible is a steep scarp pulled from the center of the map with a Blend brush. The rim of a crater is visible in the upper left. It is a simple matter to plot an animated path through this landscape. Animations rendered directly in DCTV (Digital Creations) format are relatively small and very impressive.

The series of views from a higher altitude (see Figure 3) was generated in Vista Pro as a flyby. This gives another perspective on how the painting translated into three dimensions. The craters made by jiggling a half-inch Shade brush show up clearly from this altitude. The different rendering style of Vista Pro is also evident.

Let's return to the painting stage for a moment. I mentioned the problem of pixel aspect ratio. If you were to paint a perfect circle in DPaint on a 320×200 screen, in Vista Pro or Scenery Animator it would wind up stretched severely in the north-south dimension. A simple painting procedure can eliminate that distortion.

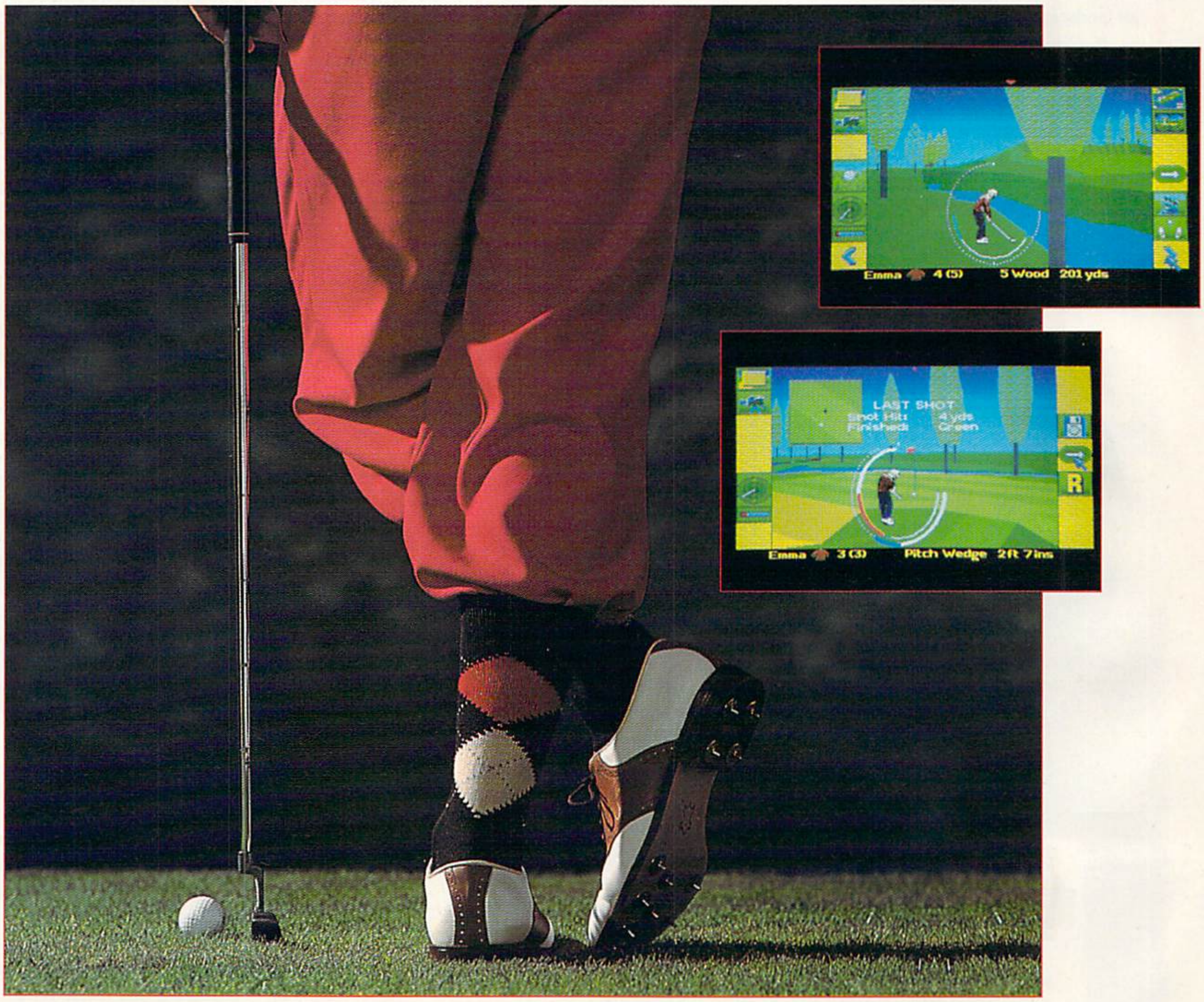
Open DPaint to a lo-res 320×200, 32-color screen. Go to Page Size in the menu and enter 320 by 258 so that you can paint on the full area that ScapeMaker can grab. Paint as before with Shade and Blend, using the cursor keys to scroll around the extended screen. You can use coordinates to mark the screen at about 260, indicating the horizontal limit of what ScapeMaker will grab.

When the painting is finished, go to Screen Format and select Interlace 320×400. When the Stretch Image requester appears, click on No. The landscape will appear on the screen, compressed vertically. Save it and proceed as before with ScapeMaker. There will be no noticeable distortion in the rendered image.

And Now for Some Special Effects

There is another great landscape program—also from *Virtual Reality*—that has recently become available. ►

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Genesis: The Third Day

Shipping too late for inclusion in this article, Genesis: The Third Day (MicroIllusions, $149.95) is another major landscape generator for the Amiga. Because it does not accept the format of DEM files shared by ScapeMaker, Vista Pro, and Scenery Animator, Genesis cannot at this time be used as a renderer for the techniques described in this article. Genesis can, however, load its own proprietary DEM format files via the included Dem2Gen program. Dem2Gen allows the creation of animations through nine quadrangles of one-degree or 7.5-minute data. MicroIllusions is selling DEM data disks for many regions of the US.

TerraForm ($39.95) does not load and convert IFF images. Instead, it has a great interface, crammed with tools for altering and editing existing DEM files or for creating them from scratch. Figure 5 shows the TerraForm screen with my DEM landscape loaded. You can see where I have used my favorite TerraForm tool, the Nuke button, to add a couple of craters to the landscape. Other tools smooth, roughen, create hills, raise, lower, steamroll, and so on. The 3D View window allows fine-scale editing, point by point, with the mouse. This is really a fun program.

For building landscapes from scratch, it would be hard for anything to match the speed and flow of Shade/Blend elevation painting. TerraForm, however, provides a different and broader set of tools. It is the only program I know that allows you to edit DEM files. You must render these, however, in Vista Pro or Scenery Animator.

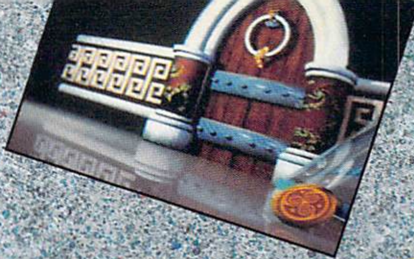
Although Vista Pro's animation features are fairly basic, a ***Virtual Reality*** companion program is now available to extend its capabilities. **MakePath** ($39.95) is a powerful interface for designing simple or complex animation paths through a landscape. Several default models, available right from the menu, provide a variety of elevation, camera, and speed settings, including Glider, Jet, Cruise Missile, Helicopter, Dune Buggy, and Motorcycle.

You can control pitch, bank, acceleration, and a host of other options from the interface screen. You can even include Barrel Rolls automatically. The saved settings are loaded as a script in Vista Pro for execution.

One last ScapeMaker stunt deserves mention. The Double Exposure mode allows you to grab an IFF image and add its elevation data to that of a previously loaded DEM file. The results are impressive, as you can see from the illustration that opens this article. This is a Mount St. Helens DEM file, double-exposed with text and an arrow done in DPaint. The rendering was done in Scenery Animator. A future "Accent on Graphics" column will explore double exposure in greater detail.

If this article barely touches the surface of these programs, it is because I want to emphasize the thread of interaction possible between human painting and computer rendering. Landscapes evolve in an exciting realm where the artist's skill and imagination work in collaboration with the style of the software in Amiga cyberspace. ■

Joel Hagen is a contributing editor to AmigaWorld *and the author of* AW's *monthly "Accent on Graphics" column. His credits include work in art, astronomy, science fiction, and software development. Write to him c/o* AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*





All photographs are of actual DCTV screens.

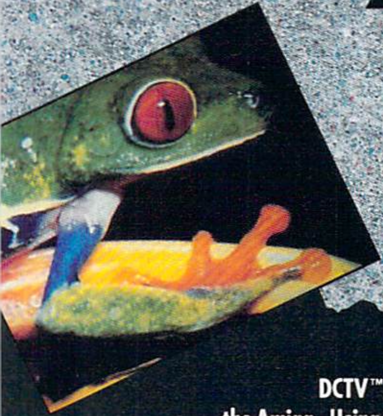
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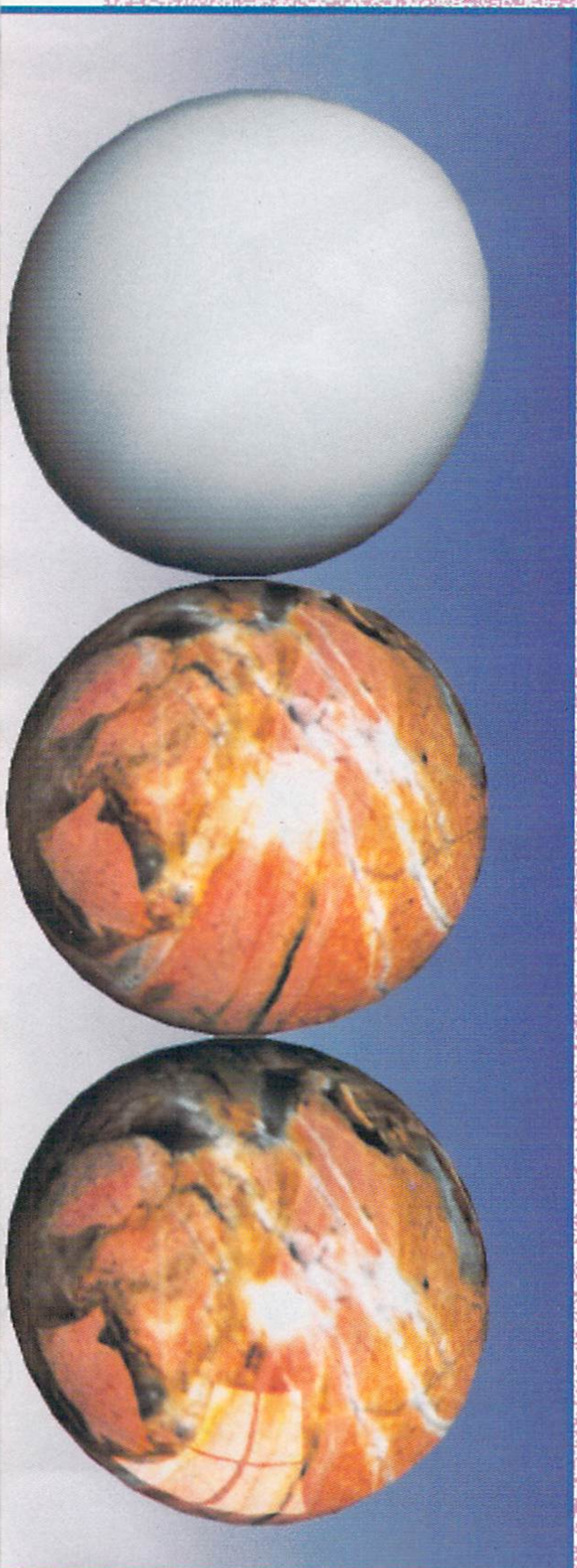
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"Mapping" New Worlds

By Louis Markoya

Like today's sophisticated advances in cartography compared with the fancifully inaccurate, hand-drawn efforts of early map makers, texture—or image—mapping on the Amiga has come a long way in terms of conveying complex, richly detailed, realistic effects. Only in 1987 did Impulse's Turbo Silver break new ground in allowing IFF images to be mapped on flat planes (grounds). Since then, we have added powerful new tools to our imaging arsenal, including reflection mapping, filter (or transparency) mapping, bump (or altitude) mapping, global (or environmental) mapping, backdrops, and many combinations of the above.

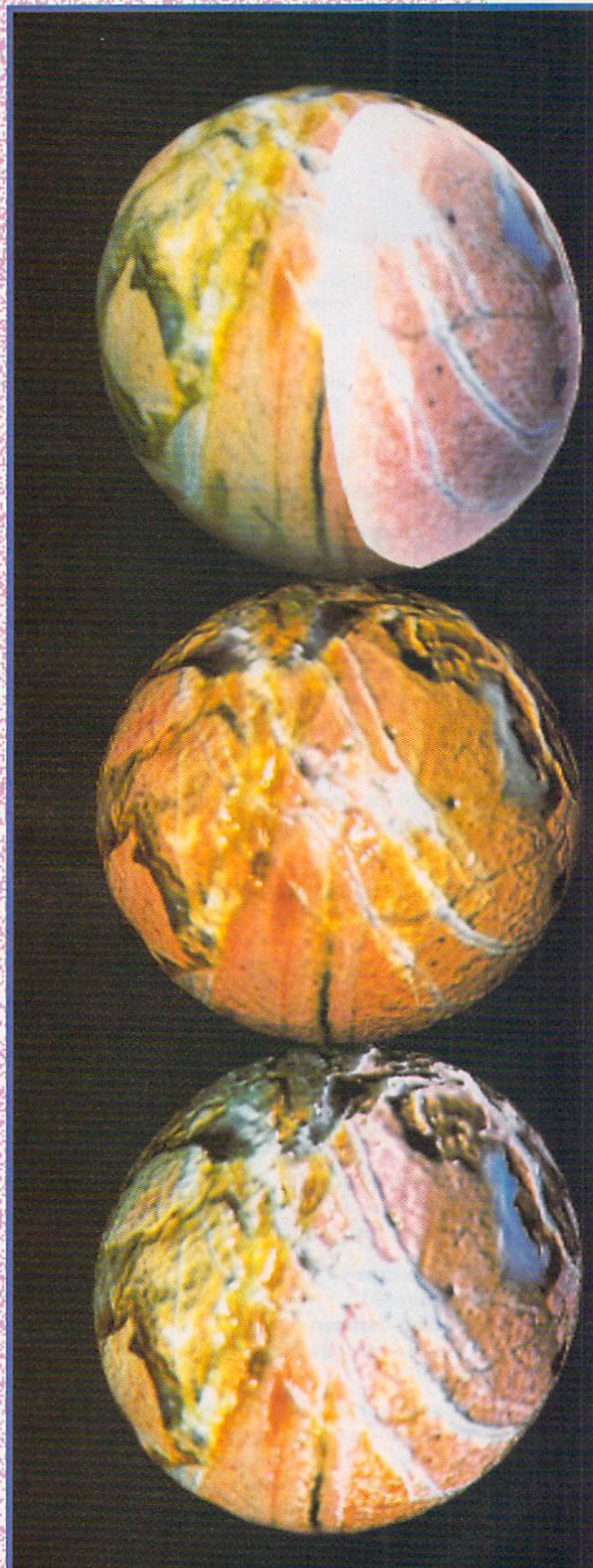
Among Amiga ray-tracing and solid-modeling programs, **Imagine** ($350, ***Impulse***) and **LightWave 3D** (bundled with the **Video Toaster**, $2495, ***NewTek***) offer the most mapping options, with many similarities between the two programs. These advanced mapping techniques allow you to create complex objects that are difficult, if not impossible, to construct through modeling alone, and they add greater realism and visual punch to your traces. This article will introduce you to mapping techniques, give some hints on maximizing their use, and briefly describe some of the many individual texture packages that have appeared in this fast-growing market segment. *(To locate the vendors of products mentioned, see the "Manufacturers'/Distributors' Addresses" list on p. 112.)*

Before I cover any specific effect, program, or texture package, it is important that you, the user, first take the time to consider the effects you wish to achieve. Doing so will force you to consider the type of map(s) to use, the type of brushes or images needed to achieve the effect, the sizing of the objects within your scene, how much memory you have available, and a number of other parameters. All of these will determine your ability to create the effect you desire and will shape just how you need to go about it.

A Multitude of Maps

Color mapping simply maps the IFF image you desire on the object exactly as it is viewed, in full color. Both LightWave 3D and Imagine support normal Amiga IFF resolutions/bitplanes as well as full 24-bit images. This type of map is used for backdrops as well as for wrapping solids, such as stone, onto objects.

New 3-D modeling programs with advanced features are providing Amiga users with new methods of image mapping that yield outstandingly rich and realistic results. Well-known Amiga artist Louis Markoya offers this tutorial guide to texture-mapping techniques.



Filter, or transparency, mapping maps a pattern defined by the gray scale onto an object, making areas at the ends of the spectrum (black or white) completely opaque or transparent. You can employ this effect to make clouds, lace, or any variety of complex objects requiring holes. You can use the gray scale to make the transition abrupt or soft-edged.

Reflection mapping is like filter mapping in that it uses the gray scale to designate areas. Here, though, the black/white extremes reflect totally or do not reflect at all. Obviously, it is an easy way to make complex shapes reflect on objects. The famed SIGGRAPH artist Y. Kawaguchi uses this technique to great effect.

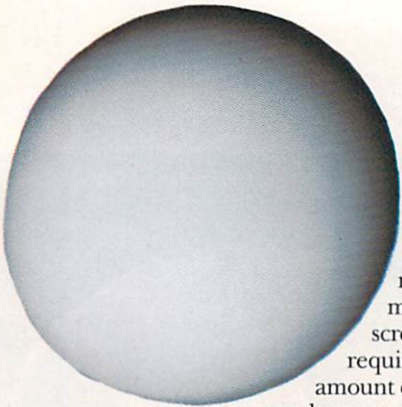
Bump, or altitude, mapping uses the gray scale to raise or lower features on an object in the shape of the brush. One extreme raises the surface at a particular point, while the other creates a depression. The results are bumpy surfaces that look quite realistic. The effect is widely used to create raised features that are nearly impossible to model. The face on a coin, the bumpy skin of an orange, or the raised veins of marble are easily achieved with this method.

Global, or reflected-image, mapping maps a reflected image on an object as if the image were the "world" about the object (which is why it is also referred to as "environmental" mapping). This method is used to map a chrome-like color gradation on letters over a black background or, more often, to map the reflected highlights on flying logos. Beautiful things happen using simple brushes mapped to produce specular highlights on logos or other objects.

You can use all these mapping effects in both solid modeling and ray tracing; the latter offers the advantage of true reflection and refraction, although it also increases rendering time substantially. Many striking effects are possible with any one of the above methods, but it is when they are used in combination that real magic begins to happen, and your traces start to take on the professional look of work done on much higher-end systems. Before we move on to combining techniques, however, let's consider some other factors that will affect the success of your texture-mapping experiments.

First Things First

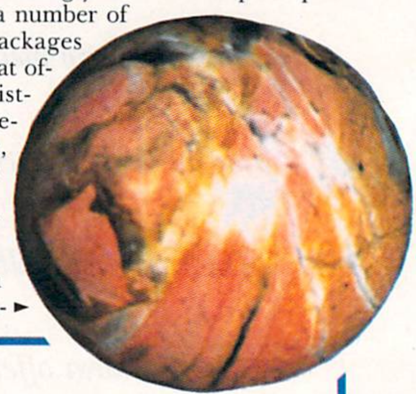
Object size is an important factor in selecting textures. If the object is small in the scene and will remain small in an animated scene, a ►



texture may not show up at all unless the contrast or effect is dramatic. At first glance, you may be drawn to a great-looking texture containing lots of fine detail—*all* of which, unfortunately, will be lost if the object you are mapping onto does not nearly fill the screen. The effects you want frequently require textures that exhibit a surprising amount of contrast; the design of such textures may become radically different from what you first envisioned they would be. Only when viewed on your object, in your lighting conditions, can the true value of the texture be estimated.

Not only is the overall object size important, but it also makes a difference if the faces are flat or curved. This is especially true in reflected-image mapping, where a texture with fine detail can produce very beautiful, nearly unrecognizable glints and gleams on the face of a logo when used as a reflection map. Above all, don't be afraid to experiment and try maps in places where at first they may not seem to fit.

Once you have decided on your mapping methods, consider the image(s) or brushes you will need. Making your own maps is as easy as scanning or digitizing an existing picture or drawing your own in a paint program. In addition, a number of texture-mapping packages are now available that offer ready-made assistance. If possible, before you purchase, check to see if the manufacturer includes pictures of the textures; if not, ask your dealer if you could view the tex- ►



Ready-Made Textures

THE FOLLOWING ARE a few of the texture packages now available for the Amiga. Many more will doubtless appear in the near future. Be sure to try to get a look at just what they contain before you purchase. Price is often not the determining factor with these packages, because you may find more textures of use to you in a small, inexpensive collection than on a more costly, multidisk set.

Photon Paint Surface Disk
Woods and Marble
MicroIllusions
Two-disk set / HAM
$29.95

This collection may have been the very first brush-texture package for the Amiga. The images are tried-and-true HAM pictures of stone and wood that by today's standards are of medium-to-good quality, but they have been used in a wide array of beautiful Amiga artwork. Don't let the age or price of this package turn you away from it.

Pro-Textures
Volume #1
Merlins Software
Ten-disk set / 24-bit and HAM
$59.95

A wide variety of seamless textures makes this package attractive. It offers textures from marble to clouds and water—in HAM, as well as 24-bit, for those occasions when the latter is not a real necessity. The manual provides a few hints, and the cover picture offers a look at some of the textures offered.

Full24 Textures #1
Brush Maps #1
Bump Maps #1
AirStream Graphics
Five- and ten-disk sets / 24-bit, 8-bit, and 16-color
$30–50

AirStream's first offering in this field, these sets offer a wide variety of textures. Some are rather odd, but may prove just the ticket for unusual effects. I found the brush maps to be sized properly to save memory. The packaging was not available for the preview sets I received.

Image Catalog 1
Stone and Wood Patterns
Robert Young
Custom order / 24-bit and HAM

Robert Young's Image Catalog is a great little Director (Right Answers Group) program that displays samples of all 30 of his brush textures. They are good-to-excellent quality stone and wood textures. You can view the Image Catalog file and order only the textures you wish on a fee-per-texture basis. This is a great idea, and the package is well done.

Texture City
Pro-40 and Pro-15
Texture City
Disk and Syquest collections / 24-bit, HAM, and DCTV
$299.95 and 159.95, respectively

Texture City offers the most comprehensive collection of textures for the Amiga. The Pro-40 package includes a wide variety of different textures—some useful and others perhaps not—all of which are well done, with excellent color and resolution. There are two Pro-15 packages, one diversified and the other dedicated to stone and wood textures. The packages are a bit pricy, but are high in quality, and they represent a great addition to the professional studio.

Virtual Marble
Volumes 1 and 2
Rapid Eye Technology
One disk each / HAM

I have seen only a flyer for these collections of stone and marble patterns, but if the images supplied match the pictures on the flyer, the quality may be quite good.

MapMaster for Imagine/Lightwave
Computer Imagery
Three-disk set

This set, my own offering, comprises 14 gray-scale organic textures designed for bump, reflection, and transparency mapping. A full tutorial and a manual are included.

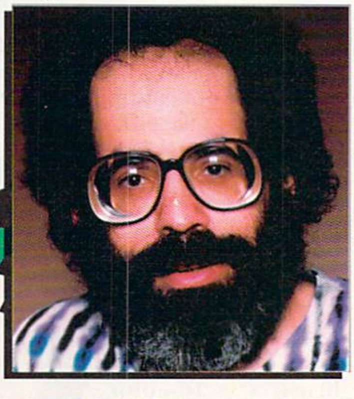
Materials Texture Library
Volume 1: Stone Surfaces
MicroSearch
Five-disk set / HAM
$49.95

These textures are generally of higher quality than the MicroIllusions bunch and offer more variety in the area of stone. The manual includes pictures of all the textures and offers a few hints for their use.❑

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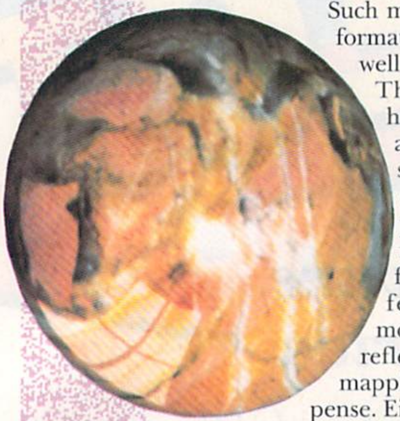
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tures first. While they constitute a handy source of material, they may not provide the solution you need, as some of the packages may contain few, if any, usable textures. In any case, I have included mini-reviews of some of them in the sidebar "Ready-Made Textures" that accompanies this article.



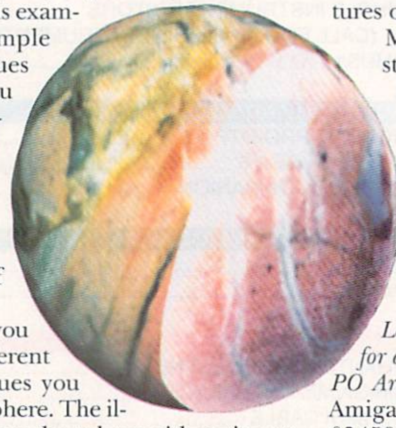
Such maps are now available in 24-bit format for greater color resolution, as well as in normal IFF Amiga modes. The 24-bit files are capable of holding true color information, albeit at the cost of increased file size, so if you are interested in doing color maps, these are probably the choice. (Keep in mind, though, that many fine effects can still be achieved with fewer colors by using HAM mode.) You can also use them for reflection, transparency, or bump mapping, but at even greater RAM expense. Eight-bit gray scale or normal 16-color IFF in grays will usually do the job just fine and save you precious RAM space.

When using combinations of maps, remember that you can employ the same brush for several effects, which also saves memory. Mapping the same brush in different ways or at different magnifications can make it seem completely different from one object to another. Texture or brush size is also an important factor. If you are not using the brush as a background map, then full-size overscan is not necessary. If the brush does not need to contain extremes in detail, you can probably get away with a small size, too, again saving memory. One brush feature used by a number of developers, edge matching, allows you to repeat a pattern without "seams" appearing along the edge of the brush. This is excellent for repeating patterns and wide expanses.

Finally, a perfect companion product to have for mapping textures is **Art Department Professional** ($299, ***ASDG***). It allows you to scale, add contrast, lighten, darken, or combine your textures—all in full 24-bit or any other IFF mode possible.

Mix-and-Match Mapping

In the following section, I will outline a typical sequence—or combination of mapping techniques—I would use to map an ordinary object in a marble brush. For this example, I have chosen a simple sphere, but the techniques will work on any object you desire. Use the illustrations on the opening spread of this article to help you follow the example—as well as to plan other, different mapping combinations of your own choosing.

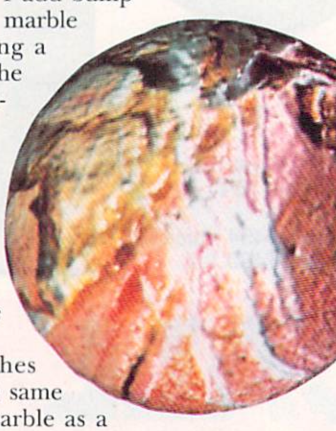


On pages 50 and 51, you see the results of five different image-mapping techniques you can apply to a common sphere. The illustration on page 50 shows the sphere with no image



manipulation (top), with a marble texture color-mapped onto it (center), and the same color-mapped sphere also reflection-mapped with a simple black-and-white "window" reflection (bottom). On page 51, the spheres are all color-mapped, but with additional mapping effects applied. On the top, reflection-mapping the environment adds the color and horizon to the sphere. The center sphere is bump-mapped to raise the veins of the marble and to place indentations on the dark areas. The sphere at the bottom is both bump- and reflection-mapped, which adds environmental color to the lighter areas on the sphere and colors the marble with those reflections.

Now on to the example sequence: First, I select or scan the marble I desire, making sure the brush contains sufficiently different patterns and enough contrast to be effective. I usually load and save this image in AD Pro, scaling it to a common screen size (640×400) to save memory. I add bump mapping to make the marble more realistic—creating a gray-scale version of the brush in AD Pro and adjusting the contrast upwards just a bit to provide more dramatic features on the surface of my sphere. I save the second brush as a 16-color IFF image in the same resolution.



Both of these brushes will be mapped to the same object, the original marble as a color map, and the gray-scale version as a bump map. It is therefore important to map both images in exactly the same way and place on the object so that all features align properly. That done, I load a simple black brush with four white rectangles placed on one side and map it as a reflected, or environmental, map. This provides a highlight in the object that looks like a window reflection—a glossy look often seen in pictures of eyes—adding more beauty to the sphere.

My example is simple, but the effect is an outstanding one. By experimenting with different kinds of textures and trying them out with various combinations of mapping techniques, you will soon be creating some dramatic effects of your own. I have offered some general guidelines here to help, but don't be afraid to break the rules when the right opportunity presents itself. That's when some of the more stunning—and magical—results happen. ■

Louis Markoya uses his Amiga to do freelance graphics for corporations. He is the 1989 winner of the AmiEXPO Art Conference's 3-D competition. Write to him c/o AmigaWorld, *Editorial, 80 Elm St., Peterborough, NH 03458.*

Prepare to Meet Thy AUDITOR

Death and taxes may be inevitable, but at least you can survive an IRS audit with prudent preparation.



Next to a death in the family, it could be the most distressing news you will ever receive: You are being audited by the Internal Revenue Service! Those sweaty palms and that bowling ball in the pit of your stomach will be with you from the time you are notified until the ordeal is over. It's the adult version of being called to the principal's office.

But why should you worry, you say? You keep all your financial transactions and records on your trusty computer, and you are honest to a fault, correct? Well, get worried, because if you are ever audited, you enter a dimension of time and space you might call the Internal Revenue Twilight Zone.

Computerized Filing

Computers are wonderful things, and with everything they do so well, it stands to reason ►

By Gary Ludwick

that they ought to be a major help in making your annual tax return simple and quick. More to the point, their ability to organize and categorize should make them invaluable should a tax audit ever occur. Maybe, but not without a lot of help from you.

When it comes to filing your annual tax return, computers are, if I may be frank, limited in what they can accomplish for you. Most of the tax-preparation programs available, such as **Data-Tax** ($59, ***Datamax Research***), are of the spreadsheet variety. That is, they perform all the math functions on the various forms and insert the right totals from the various schedules in the proper places on the summary page. And, if you change one number on a schedule, they will change all related totals wherever they occur.

What they *won't* do, with few exceptions, is generate the numbers that go into all the schedules. All those deductions, write-offs, and income and depreciation numbers originate in the old-fashioned way, with you wading through endless pieces of paper using a pencil and an adding machine. Discouraging, but unfortunately true.

Of course, if you are using a computerized checkbook or accounting program that records most of your financial transactions, it can very likely generate many of the totals and breakouts you need. The problem is that you have to enter your numbers in that one program all year long, and then generate the totals to be entered in a tax-form preparation program.

The last step can be cumbersome and time-consuming, and may be an example of where "manual" is superior to "computerized." In the time it takes to enter all your numbers into the tax package, you could easily enter them manually on the 1040 form we all know and love. A simple pocket calculator can do all the math you need.

There is, however, at least one program available (and there may be others) that shortcuts this keyboarding nightmare. **Phasar** ($89.99, ***Marksman Technology***), a home/business accounting system package, combines a very powerful checkbook and accounting program with a basic 1040 tax package. The tax-program aspect is essentially a spreadsheet that looks like the 1040 form plus any of the supplementary schedules

Tax Information Categories

THE OLD COMPUTER homily about "garbage in, garbage out" (GIGO) has never been more true than when you are talking about tax accounting and financial program systems.

Business-Related List of Accounts

Current Assets:
- Cash
- Savings
- Petty Cash
- Accounts Receivable—Officers
- Accounts Receivable—Employees
- Federal Corporation Tax Deposit
- State Corporation Tax Deposit
- Federal Unemployment Tax Deposit

Fixed Assets:
- Land
- Buildings
- Building Improvements
- Automobiles
- Office Furniture & Equipment
- Accumulated Depreciation—Building
- Accumulated Depreciation—Improvements
- Accumulated Depreciation—Automobiles
- Accumulated Depreciation—Office Furniture

Other (Start-Up Costs):
- Organizational
- Deposits
- Prepaid Interest

Current Liabilities:
- Federal/FICA Withholding Payable
- Sales Tax Payable
- Federal Corporation Taxes Payable
- State Corporation Taxes Payable
- Notes Payable

Long-Term Liabilities:
- Notes Payable

Stockholders Equity:
- Common Stock
- Additional Paid in Capital
- Retained Earnings

Income:
- Revenue
- Interest
- Investment

Cost of Sales:
- Outside Production
- Wages
- Contract Labor (Form 1099)
- Other

Expenses:
- Accounting
- Advertising
- Amortization
- Bank Charges
- Building Upkeep
- Car/Truck Gasoline
- Contributions
- Depreciation
- Dues & Subscriptions
- Education
- Electricity
- Federal Corporation Tax
- Heating
- Insurance—Officers
- Insurance—Business
- Interest
- Legal
- Licenses
- Medical Plan
- Miscellaneous
- Office Supplies
- Payroll Tax—FICA
- Payroll Tax—FUTA
- Payroll Tax—SUTA
- Pension Administration
- Pension Contributions
- Postage
- Property Tax

you need to create. What makes it valuable is its ability to "look up" category totals from the accounting program and insert those numbers on the correct lines of the tax form.

Another feature of Phasar allows you to enter budgets in all categories for every month of the year. The program can then perform tax projections at any time, using your actual figures to date and the budgeted numbers for the rest of the year.

Business accounting programs—such as **Service Industry Accounting** ($199, ***Brown-Wagh***) or **The Accountant** ($299.50, ***KFS***)—seldom provide a tax-computing feature. Most programs such as these are based on the premise that an accountant will do your year-end returns and reports, so they are generally organized to provide your accountant with all the necessary information and numbers, organized in a format that will require the least amount of billable time.

Dear Taxpayer...

So now you've satisfactorily organized your information and filed your return, and then, several years later, you suddenly receive the fateful notice: You are summoned to an audit! Of course, all you do is just hit a button, print out the information requested by the IRS, show up at the appointed time and deposit those neat-looking sheets on the auditor's desk, and assume they'll be so impressed with your computerized organization and record keeping that they'll just pass you on with a "no change" recommendation.

Fat chance! You stand a better chance of finding a mint 1957 Porsche Speedster in a barn somewhere, for *original* documentation is the only thing that counts with the IRS. The best-organized computer printouts in the world carry little or no weight in an audit, compared to the original receipts.

For example, a MasterCard billing statement will not take the place of the original charge slip and detailed receipt/invoice. This is true of any expense you are claiming as a deduction, whether the transaction is by check, credit card, or cash.

In short, the IRS wants paper—original, detailed, and specific paper—so keep your receipts! Computer ►

The following is a list of accounting categories and expense listings that will provide a good starting point for users setting up a financial system such as Phasar or Service Industry Accounting. Of course, only an accountant familiar with your personal or business situation can advise you on exactly how to adapt these guidelines to your own use.

Rent—Office
Rent—Office Furniture
Rent—Auto
Repairs—Equipment
Repairs—Other
Sales Tax
Taxes—Other
Tax Penalties
Telephone
Travel Entertainment
Meals & Entertainment
Officers' Salaries
Office Wages
State Corporation Tax
Water

Personal List of Accounts

Income:

One account for each source of revenue, including interest, investments, and/or outside income.

Assets:

List all assets you currently own or are paying for at their current market value. Be sure that every tangible item (cars, homes, equipment, tools, home furnishings, etc.) you list under Liabilities has a corresponding listing in Assets.

Liabilities:

Set up one account for each note or debt payable. This would normally include all credit cards, charge accounts, alimony, loans, and so on.

Expenses:

Groceries
Electricity
Heating
Medical
Dental
Interest
Life Insurance
Car Insurance
Home Insurance
Telephone
Gifts
Entertainment
Meals—Outside
Car—Repair
Car—Gasoline
Car—Other
Vacation
Clothing
Home Repair
Home Maintenance
Home Furnishings

Add other expense categories to suit your personal situation. If self-employed or earning money outside of a salaried position, keep track of all business-related expenses that could help offset this additional income. For example:

Books & Magazines
Business Gifts
Business Meals & Entertainment
Business Telephone
Car Expenses
Car Maintenance
Computer Expenses
Dues & Subscriptions
Legal Fees
Office/Business Supplies

printouts, no matter how detailed and organized, will not make the wolf go away from your door.

How To Get Ready

Whether you're working with a check book-based system, like Phasar, or a business-oriented accounting system, such as Service Industry Accounting or The Accountant, the key to the program's usefulness lies in how well it is set up initially. For example, in every program of this type, you are required to set up your own list of accounts and expense categories. Then, as checks are written, you assign each amount to a given category. Many such transactions will have multiple categories.

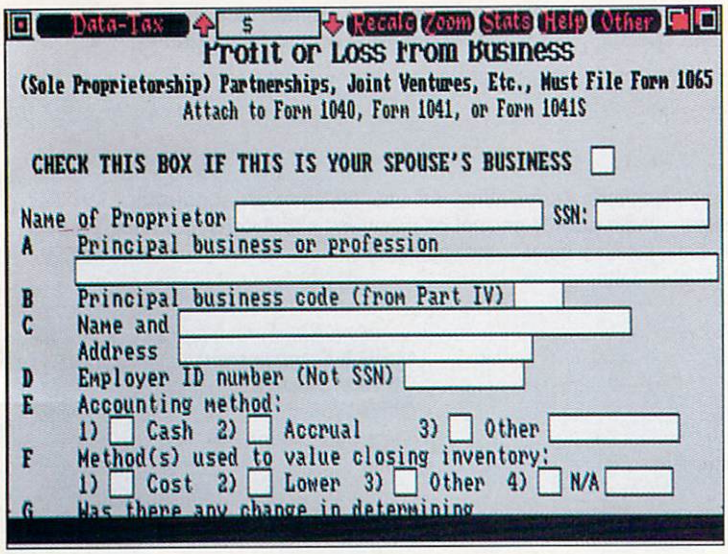
Take, for instance, that MasterCard bill. Every purchase on your monthly statement must be assigned to a specific expense category. If you set up your program using only broad-based categories (such as Business Expenses), you'll wind up at the end of the year manually trying to extract all the information you need to match the IRS Schedule C categories.

Another consideration is that in business use, almost every facet of an accounting program is aimed at the tax consequences. Depreciation, retained earnings, and accounts receivable are just a few of the categories that impact your business's tax picture.

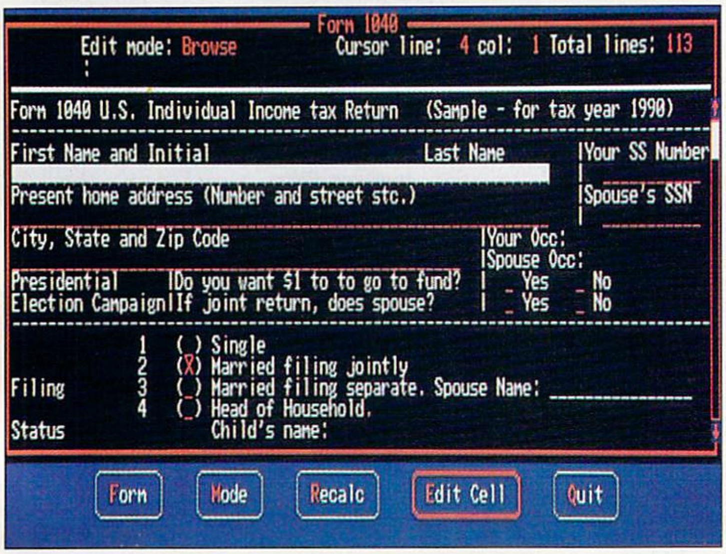
On a purely personal tax level, there are far fewer categories that carry explicit tax implications. But even though the IRS may not care how much you spent on movies or vacations or groceries last year, that information may be important to you and your budgeting.

How to balance all these conflicting needs for information? Because tax systems for business and personal use have such different requirements, there is no pat answer. In the accompanying sidebar, however, is a list of categories that accountants use as the starting point for most businesses, as well as suggestions for setting up a personal accounting system. I stress that these categories are starting points, to be adapted to your individual situation.

In setting up the expense categories for your personal use, my best advice is to go through your last tax return, identify all those areas where you have deductions, and then make sure you create those categories in your accounting/tax program. Similarly, go through two or three months worth of checks and credit-card statements to obtain the general expense categories that suit your personal lifestyle and informational needs. Because so few expenses are tax deductible for the salaried individual, most of these will be for your personal information and budgeting purposes.



The business profit-and-loss schedule from Data-Tax.



Part of Phasar's 1040 form.

The Bottom Line

The final consideration is that a computer is no substitute for detailed receipts and record keeping. If you're one of those who use the shoebox filing system, you are in for a rude awakening if you're ever audited. You'll spend hundreds of hours trying to piece together financial information that could be as much as three years old.

What's the best system? A computer-based accounting/tax system with a *matching* paperwork filing system. For every category of income and expense you keep in a computer, create a matching filing system to keep track of the supporting paperwork: receipts, monthly statements, cancelled checks, and the like. Or, if you prefer, create a filing system matched to specific sections of the tax forms.

While it's more work than simply keyboarding in your check-writing activities, it will greatly facilitate your year-end tax computation. More important, it is guaranteed to save you both hours and possibly many dollars should the IRS come knock, knock, knocking at your door.

Quoth the audited, "Nevermore. Please, dear God, nevermore!" ■

Gary Ludwick is president of The Creative Department, an advertising agency based in Charlotte, North Carolina. The Amiga has been an essential part of his company's video, graphics, and presentation capabilities for the past five years. Write to him c/o AmigaWorld *Editorial, 80 Elm St., Peterborough, NH 03458.*



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ACCENT ON GRAPHICS

New Thrills With DPaint Fills

36

A continuing series of tips, techniques, and tricks for creating more imaginative Amiga graphics.

By Joel Hagen

GRADIENT FILLS ARE one of the most entertaining features of any computer paint package. Cascades of color automatically flood shapes on the screen. Carefully used, gradient fills are powerful graphic elements, and they have become a hallmark of the "computer style." This month, I will focus on new fill options in the recently released DeluxePaint IV (Electronic Arts—see p. 18 for a complete review and p. 24 for a tutorial on its use) and on a technique of my own, the "outline fill."

DPaint IV's Fill requester offers five new gradient-fill options, bringing the total to eight. The three original fills from DPaint III—Horizontal, Vertical, and Horizontal Line—function as they did before. The new fills are Line, Shape, Circular, Contour, and Highlight. The illustration accompanying this column shows how some of these Fill options affect a simple line drawing. The "outline fill" in Figures 1–3 (top row) will be discussed below. Underneath that sequence is a comparison of the effects of the four automatic fills that follow contours, each shown with its associated button from the Fill requester. At the bottom of the illustration is DPaint IV's new Range requester, showing how the colors for these gradients were set up.

The first (from the left) example in the middle row shows the Horizontal-Line fill familiar from earlier DPaint versions. The gradient changes line by line to follow all contours. This is the only flood-fill option that is affected by internal lines in a closed drawing.

The second example demonstrates Shape, a new linear fill that follows the contour of a shape but allows you to direct the angle of the fill within that form by dragging out a line.

Third is Contour, one of three new radial gradients. Successive colors from a Range radiate from the point where you click, but follow the contours of the shape they fill.

The fourth, Highlight, is similar to Contour but modified to allow more color variation at the edges of a shape. I find its effects a bit more natural and realistic.

In addition to the new DPaint automatic fill features, there is another manual-fill technique using DPaint's outline function that I find very useful. I developed it as a fast way to turn a line drawing into a solid form having the look of highlight and shadow. It is especially suited to filling complex drawings with shaded volumes that follow every convolution of line. The three figures in the top row of the illustration present the sequence for doing an outline fill.

Just Dial O—For "Outline"

In DPaint III and IV, the o key automatically outlines any brush you have picked up. This is a powerful way to emphasize the edge of a complex shape. Simply cut a brush, pick a pen color with the left mouse button, and press the o key. A single-pixel outline appears in the selected pen color. You can repeat the process as often as you like, building up a thicker and thicker outline. Also, you may select different pen colors at any time.

I work with the Continuous-Freehand line tool to draw shapes or figures. Picking up the drawing as a brush, I can use the outline key to thicken the lines or to add color. Such a brush will be outlined on both sides of all lines. This is the basis for the outline-fill method. Using a succession of pen colors, you press the o key repeatedly until the drawing fills in completely. In my example, I used the

DeluxePaint IV not only provides additional built-in gradient-fill features, but also offers opportunities for you to devise new fill techniques of your own.

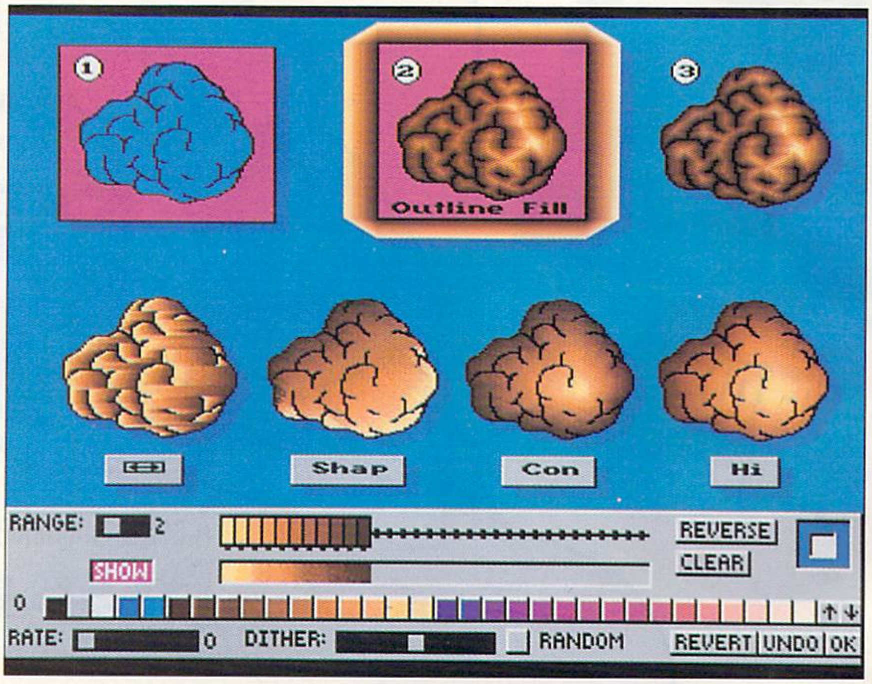
same browns and yellows of the gradient fills for comparison. Bear in mind, however, that this technique does not require you to set a Range; you may follow any sequence of palette colors.

Experiments with outline fills show that there is an important interplay between the number of colors used, their range of values, and the distance between lines in the drawing. If you use only three or four colors to fill a drawing in which the lines are far apart, any sense of volume will be limited to the area near the lines. Conversely, if you use 20 or 30 colors to fill a drawing with lines in close proximity, the spaces will completely fill long before all colors are used.

You must make a judgment at the outset to balance the number of intended fill colors with the spacing of line elements in the drawing. Notice in the example how lines that are closer together restrict the outline fill to the darker colors used first. Those areas simply fill in quickly. In more open areas of the drawing, a greater number of colors are used, creating highlight effects. This variation enhances the illusion of light and volume. If an area of a drawing is too broad and open, adding even a single pixel can greatly alter the way it will fill. That pixel becomes a node from which each outline color will expand.

The method that I find works best is to make a box around the drawing with the Rectangle tool. Fill the box with any color, as in Figure 1. Pick up this entire box, making sure that the interior of the drawing is transparent (the right mouse-button color). With the left mouse button, select the darkest color you intend to use and press the o key to add an interior outline to the drawing. The filled box prevents the distraction of an outline being added to the outside of the drawing. Instead, it appears around the box, as in Figure 2.

Continue this procedure with lighter and lighter colors until the drawing is completely filled in. Although you may run out of colors before this occurs, just hold the last color and keep pressing the o key until the fill is complete. If the colors are in sequence, you can use the bracket keys—[]—to move up or down the palette. This keyboard shortcut makes doing outline fills very fast. When the object is completely filled, you can remove it from its box with the brush tool, as in Figure 3.



The illustration compares the effects of some of the automatic fill features in the new DPaint IV with a manual technique, the "outline fill."

Remember, though, to first select the color in the box as a transparent background color with the right mouse button. ■

Joel Hagen's credits include work in art, astronomy, science fiction, and software development. Write to him at 10512 Sawyer, Oakdale, CA 95361. Please include a stamped, self-addressed envelope for a reply.

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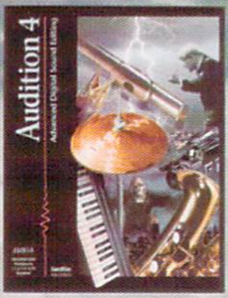
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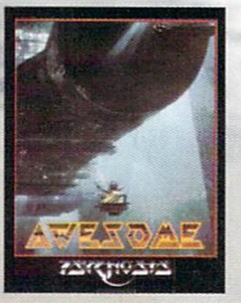
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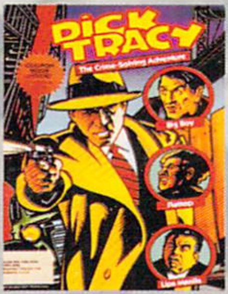
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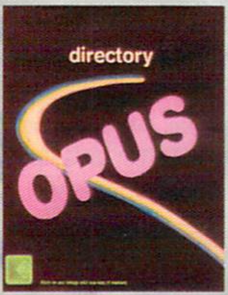
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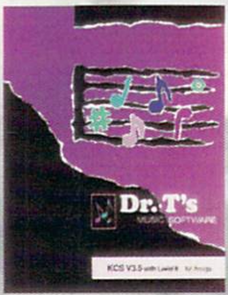
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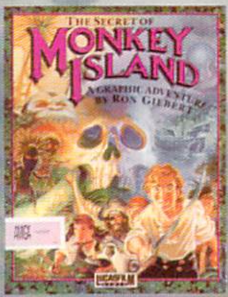
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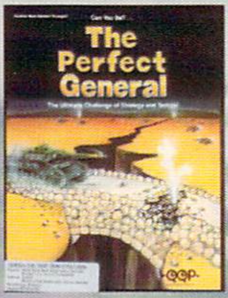
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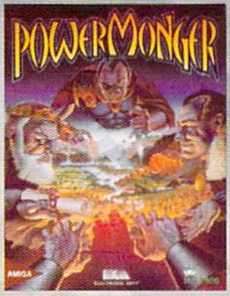
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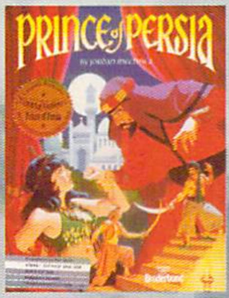
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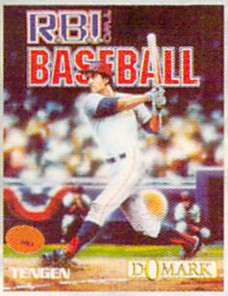
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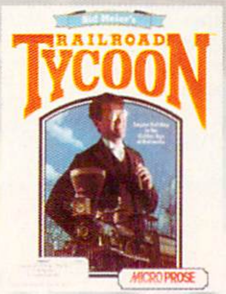
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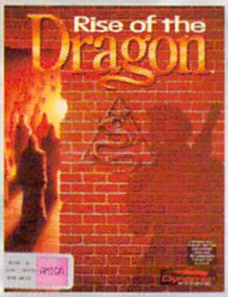
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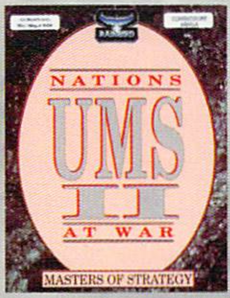
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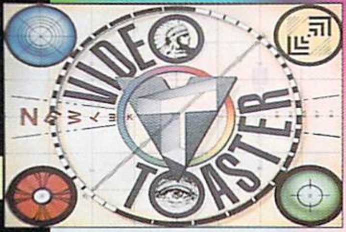
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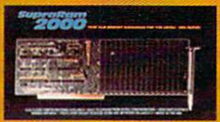
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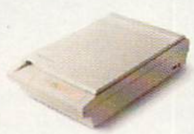
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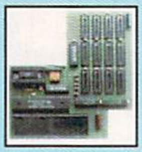
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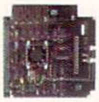
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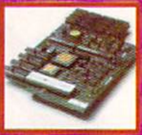
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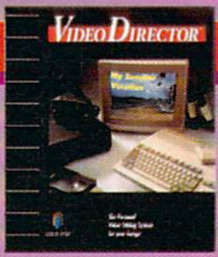
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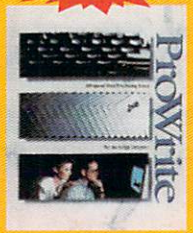
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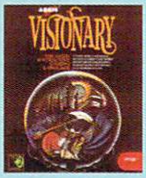


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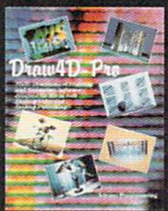
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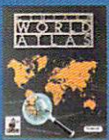
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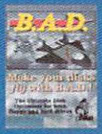
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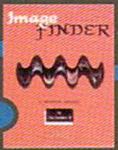
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THE GAME PRESERVE

SILENT SERVICE II

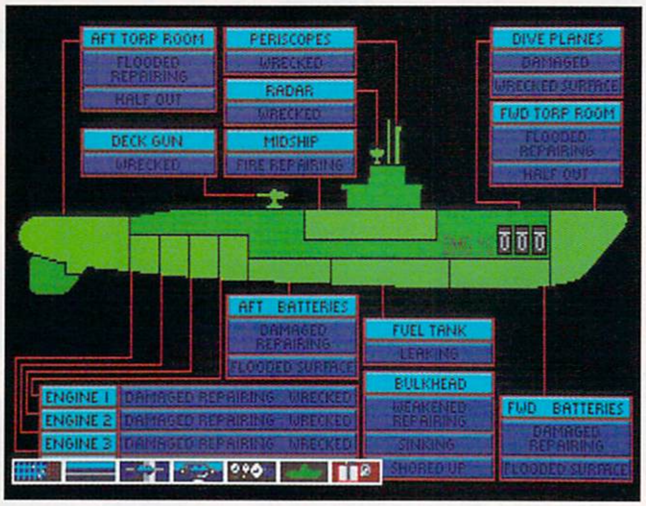
By Jeff James

MicroProse's **Silent Service II** ($59.95), the sequel to Silent Service, may be the new standard by which World War II submarine simulators are judged.

Like the original, Silent Service II casts you as the skipper of a U.S. submarine in the Pacific during World War II. Play options abound, including nine sub types (all with historically accurate performance data), four difficulty levels, and a plethora of mission types.

Novice submariners can practice in simplified training missions, shooting torpedoes at stationary rust-buckets that don't shoot back. Then it's on to the more advanced single-battle and war-patrol options, the former including re-creations of several harrowing missions actually undertaken by American sub crews in WWII. Finally, the war-career option invites you to sail through the entire war in the Pacific (1941-1945), earning promotions and commendations in the process.

If you plan to tackle the entire tour of duty, it's a good idea to master each of your sub's several operating stations first. The chart screen shows an overhead view of the sub and any detected enemies, while damage-control and engine-room screens monitor the sub's health. All ship controls are accessed by keyboard or by mouse; you jump from station to station by either pressing the relevant function key or by clicking on one of seven tiny icons in the lower-left corner of the screen.



"We've been hit! Damage control, how bad is it?"

The game's wealth of keyboard and mouse controls can overwhelm a novice user, so MicroProse has included a pair of keyboard overlays (one for the A1000 and one for the A500/A2000/A3000) to facilitate your ship-sinking operations. More assistance is available from the skillfully written 130-page instruction manual, packed with strategy tips, tutorials, and historical ephemera. Enjoyable reading, the manual engrossed me almost more than the game itself.

Silent Service II's graphics were ported from the 256-color IBM VGA version and seem to have survived the transition well. Screens of the sub firing torpedoes and being depth-charged are beautifully animated. MicroProse claims that the images of Japanese ships were taken directly from original photographs and scaled plastic models, and I found no reason to dispute that claim.

The horizon (when viewed through the periscope or from the bridge) is pleasingly dithered, with somber purple and dark blue hues during nighttime operations. The sound effects are excellent, including the gurgling whoosh of firing torpedoes and the rhythmic chugging of the sub's engines.

The game is not disk copy-protected, and runs politely on accelerated Amigas with AmigaDOS 2.0. It requires 1MB RAM, or 1.5MB for hard-disk ►

Crib Notes

By Peter Olafson

I'm fresh out of pirate cliches to parrot. (Ah, there goes the last of 'em, flying out the window.) So, without further ado, here's the tail end of the Secret of Monkey Island (*Lucasfilm*, $59.95) walkthrough.

We left Guybrush Threepwood beside LeChuck's ship. Why just beside it? Because he can't go very far up on deck with the ghostly orchestra. (Do pop in and listen to them for it a bit, though.) They keep chasing him out, and with good reason, as they can see he's human. He'll need to borrow something from the navigator's head first. Be polite, and be persistent.

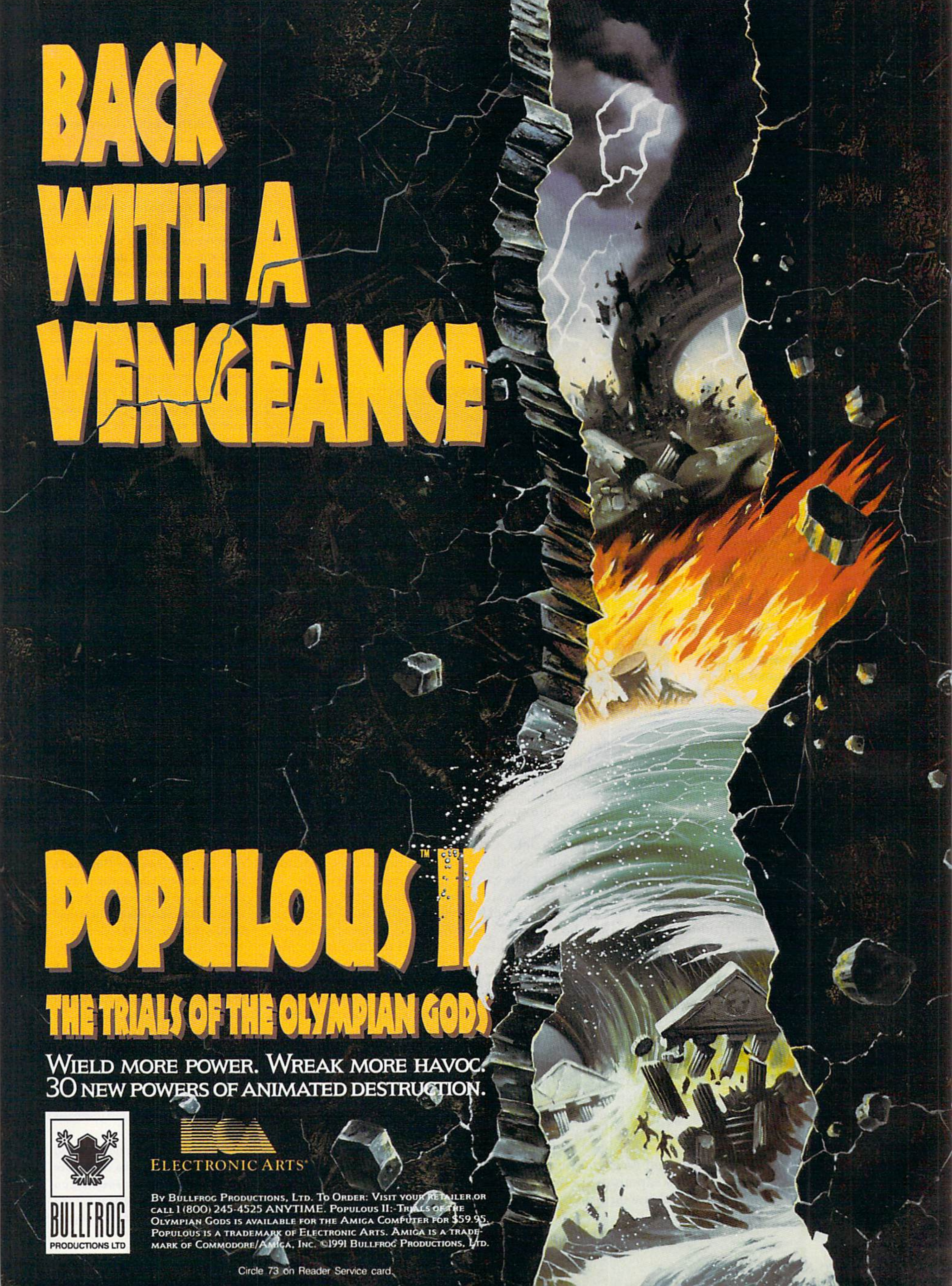
Now, Guy can search the ship with relative impunity, much as he searched his own on the way over. No, there's no way to explore the fore and aft decks, so leave 'em be. (Cute ghost dog, though.) However, there are two doors and a hatch. Let's try the one on the left.

Yikes! It's LeChuck! And even though Guybrush is invisible, the pirate detects his presence the moment he moves. Well, he doesn't have to move. Stan, the ship salesman, gave him something that should prove attractive here.

The aft door is squeaky, and LeChuck's right-hand man will keep closing it until Guy quiets the squeak, so try the hatch for the time being. After the bunk room, he'll find some ghost chickens and should be able to come up with a ghost-chicken feather.

Has there ever been a computer-game feather that wasn't used for tickling duty? Clearly, Guy needs to use the feather on the sleeping ghost to persuade him to drop the booze. But he can't seem to find a spot, right? Well, if you wait around, you'll notice that the ►

To locate developers of the games reviewed, see the "Manufacturers'/Distributors' Addresses" list on p. 112.


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installation. The hard-disk installation program (just like the one with MicroProse's F-15 Strike Eagle II and Railroad Tycoon) has a hard time dealing with nonstandard hard-disk configurations.

I have only two further gripes: The animations of the sub firing torpedoes or being depth-charged are nice to watch, but they quickly become tedious. I also had hoped that Silent Service II would include an option to see things from the Japanese submariner's point of view, but it does not offer this.

Nevertheless, these are only minor blemishes on an otherwise superlative simulation of submarine warfare in World War II. A definite must-buy for World War II buffs, Silent Service II won't disappoint you.

Lord of the Rings

By Peter Olafson

It's always tough to translate a book into a visual medium. Everyone who's read it has an idea how the characters and environment should look, and the movie or software version is bound to bump up against that personal vision. So, here's the good news about ***Interplay***'s **The Lord of the Rings** ($54.95): It captures the essence of the first volume of J.R.R. Tolkein's great fantasy trilogy without either cleaving slavishly to the storyline or abandoning it for more traditional role-playing fare.



The hobbits need your help.

The Tolkien trilogy provides much of the basis for today's fantasy role-playing games, and there have been several faulty attempts to bring it to the monitor screen. Lord of the Rings is the first game to achieve the intimate "feel" of the books.

This first of three planned games takes you through roughly the first book of the trilogy, *The Fellowship of the Ring*. It follows hobbit Frodo Baggins and his retinue on their quest to unmake a ring of power sought by the dark lord Sauron and his ringwraith minions.

It's a huge game. After settling affairs in Frodo's home, the Shire, (a leisurely and cozy way to break into the game), the party heads into a forest, the treacherous burial mounds of the Barrow Downs, the walled community of Bree, the huge dwarven mine of Moria, the elvish realm of Lorien, and more. Along the way there's much to see, folks to talk to, puzzles to solve, side avenues to explore, allies to enlist, and wolves, orcs, trolls, and worse to fight.

All this is shown in a full-screen, overhead perspective and controlled via seven icons that appear at the click of a mouse. The graphics are nice, and while the stills of the characters don't quite match my vision of them, they're a good compromise.

Combat is central to most role-playing games, but, delightfully, that's not the case here. In fact, it's important to this game's faithful feel that it isn't. You'll find no experience points or levels (although each character does have a set of stats), and no grand repertoire of weapons or spells (although characters can acquire spell-like words of power). There's fighting, naturally, but the game doesn't live or die by it, and, if you keep your wits and just observe ordinary caution, your characters will be hard to kill.

The emphasis is, instead, on exploration. You can always stick to the road, but the graphic "tiles" from which the game is built are vast, and you'll miss the fun if you just stay on the road.

Lord of the Rings would be dull if it simply followed the course of the book, and that's where Interplay's creative forces come into play. The developer has provided any number of side missions—some important, some minor, some just fun. There's always more around than immediately meets the eye.

Indeed, there's so much

ghost shifts position every so often...and that certain portions of his anatomy become available when he's in certain positions. Be a patient soul.

Okay, he's got the booze. The squeaky door gets the grease, but how do you get the grease? He'll find some down in the hold—via the hatch in the chicken and pig room (use LeChuck's key here), but there's a mammoth ghost rat in the way. You'll notice that the other rats are all dead to the world, evidently the result of whatever was in that saucer. Use the grog in the saucer, watch the rat make like a tree stump, use the grease on the door, and there you are in the brig.

Some people seem to think they should be able to get by the guard and save the governor here and now. Leave him alone; he's only there to confound you. Do, however, take the ghost tools on the wall, and then split. They will let you into that heavily-locked crate upstairs in the chicken room and win you the voodoo root.

Now back to the cannibal village to have that root turned into seltzer, and then back to LeChuck's ship to...er, what ship? Seems LeChuck has headed back to Melee to marry the gov! Nevertheless, it's Grand Central Station down here, what with the ghost henchman LeChuck left behind and your crew members, who apparently have run out of sunblock, turning up again. (Guy can kill the ghost, by the way. Anyone know if the crew still shows up if you bomb your ship with the artifact?)

You know where the church is, right? It's the one place Guy hasn't been to do anything so far (except listen to the nice music). So get there and do your best imitation of Dustin Hoffman in *The Graduate*. You'll have a little trouble spritzing the cap'n right off the bat, and you'll get your keister kicked all over Melee Island as a result (there's no way to avoid this).

Just wait until LeChuck makes the mistake of punching you into the soda machine at Stan's shipyard, and grab that loose root beer and give him a taste. You'll need to be quick off the mark, but you'll get it eventually.

Then sit back and enjoy the long game ending. There are some cute twists along the way, depending on how you handle the dialogue, and I suggest saving the game some- ►

going on in the Shire, it's tempting to hang around longer than Frodo should, as the Black Riders are already on his trail. A time limit, even a generous one, would lend a needed sense of urgency to those early scenes.

In terms of play mechanics and Amiga-specific embellishments, this isn't one of Interplay's better efforts. I haven't heard complaints from folks with faster machines (the game runs on all Amigas with one megabyte of memory), but on a 68000-based Amiga, play is decidedly slow. You have to wait for the program to draw even menu windows, and the scrolling is bumpy at best. Keyboard response is poor, and, while the mouse control (recommended) seems marginally better, the party members negotiate doorways as though they're drunk.

Moreover, the menu system is too time-consuming; for instance, you can't flip through character inventories one after the other, but must back out of each character before digging into the next. Also, two saved-game positions simply aren't enough for a game this big, and duplicate nonplayer characters turn up in places. While roads run to the eight points of the compass, characters can be aimed only in the four cardinal directions, and it's awkward to keep changing direction.

The music that accompanies the introduction is splendid, but it shuts down when the game starts, and you play in a disappointing silence, broken only by "boops" and "beeps" from the Amiga. Finally, the three floppy disks can be installed on hard disk, but all I got was visits from the guru until I assigned fonts: to the play directory.

I do recommend Lord of the Rings. It's pleasantly different from most other games of its type, and imbued with the spirit of the source material, while not bound to it. However, it's not a strong Amiga game, and I hope that by the time The Two Towers appears, Interplay will have made the control system as amiable as the wonderful feel.

MURDER!

By Joe DiCara

To some degree, each of us is a detective at heart. Unfortunately, we usually track down nothing more exciting then a lost sock or misplaced tool. Is it any wonder, then, that the adventures of Sherlock Holmes, Charlie Chan, and Colombo are so popular? *U.S. Gold*'s **Murder!** ($44.95) makes you a supersleuth, too, applying your powers of observation, deduction, and cunning to unravel a heinous homicide in a huge mansion. This time, if justice is to prevail, it's up to you!

At the opening screen of this graphic adventure, headlines on the front page of the *Daily Chronicle* proclaim the dastardly deed and you, the sleuth, are on the scene to solve the crime. Changing any pertinent information on the newspaper page results in a new scenario, and U.S. Gold claims that almost 3 million scenarios are possible. Repeating all the set-up parameters replays a case, so, if at first you don't succeed, try, try…



Get your notebook ready, you have two hours to catch the murderer.

Your view is a 3-D isometric of the crime scene—usually a room in the mansion. A set of action icons on the side let you interrogate a character, view a map of the house, refer to the all-important clue book, check for and remove fingerprints, pick up objects, and, finally, accuse the murderer.

As play starts, all you know is who was murdered, where, when, and how. Scattered throughout the 51 rooms and corridors of the three-story mansion are more than 20 potential ►

weapons. Roaming about, in real time, are 18 very suspicious and sometimes very uncooperative characters. As time slips away (there's a two-hour limit), you'll examine every object, take all the fingerprints possible, and question anything that moves or breathes. If this sounds difficult, it is, but it's also lots of fun!

To identify the culprit, you must probe relationships, check alibis, and determine who was where and when. The cross-examination process is tedious and time-consuming, and therein lies the rub. Because of the number of characters and the many possible relationships, it's impossible to ask all the questions you'd like.

Here's where your powers of deduction and reason save the day. By checking all potential weapons for fingerprints, then comparing them to prints found on common objects such as drinking glasses and cigarette lighters, it's possible to narrow the list of suspects, then turn up the heat and get the answers you need. Elementary my dear Watson…elementary!

I have no significant complaints about this game. Murder! comes on one disk, runs on any Amiga with a 1.2 or higher operating system, and requires a mouse and 512K of memory. It's not hard-disk installable as claimed in the manual, but runs completely from memory, so this is no problem. With its endless scenarios and levels of play, Murder! provides endless hours of "intriguing" entertainment.

SPACEWRECKED

By Rob Hays

You've been drifting for seven years in suspended animation when your lifeboat's computer detects other spaceships nearby and awakens you. The trouble is, this is not a rescue fleet, but a biological survey mission that has become crippled while transporting specimens back to Earth.

To reach Earth, you must repair malfunctioning systems in all the fleet's ships, because they were built with an interlocking navigation system. Along the way, you must deal with escaped biological specimens, deranged crew members, and deteriorating power and life-support systems.

Spacewrecked (*Konami*, $49.95) is a standard structured adventure, meaning that in order to advance, you need the proper items in the right place at the right time. The programmers have also thrown in the usual red herrings, figuratively and literally.

Play is completely mouse-controlled, and games can be saved at any point. The main screen shows a 3-D view of the action, data on your character's health, and the elapsed time. The sound effects are well integrated and varied, with different background noises for each type of compartment you enter.



Can you find your way back to Earth?

Although this game is much like others of its genre, such as Dungeon Master and Eye of the Beholder, it has some unique components. Probably the most unusual are robots you can program to explore and perform repairs on their own.

Spacewrecked requires 512K of memory, comes on three disks, uses both disk and documentation copy-protection, and runs properly on the Amiga 3000 with Workbench 2.04. It also has some problems that should be fixed.

First, although the MS-DOS version can be installed on a hard-disk, the Amiga version can't. Second, the program doesn't consistently recognize external disk drives or the fact that the disk it's asking for is already in a drive. Third, when you finish playing, you must turn the computer off, because part of the program survives and interferes with a warm boot (except on the A3000).

All things considered, however, if you like adventure games and can live with the floppy shuffle, Spacewrecked will keep you lost for hours.

where shortly beforehand, so you can try them all.

• Several spots in The Immortal (*Electronic Arts*, $49.95) are taking years off people's lives. The most common seems to be the triangle puzzle at the end of level 2. Actually, the answer is given in the game—by the dying goblin king ("right, left, center"), but only if you've given him your water. If you used it yourself, you greedy thing, you're facing a lot of trial and error.

You need get to the opposite end of the level, where you'll find a room with three circles on the floor, a triangle in each circle, and indentations on the three sides and in the center of each triangle. Put one gem in the right-hand hole in the left-hand circle, the next in the left-hand hole in the center circle, and the third in the central hole in the right-hand circle. Welcome to level 3.

The other hot spot is with the dragon down on level 8. You must use six Blink spells there, each of them just as the beast is about to let fly, then a Fire Protection spell. Finally, use the amulet.

• Speaking of dragons, a number of folks seem to be burning themselves out near the start of *Dynamix*'s Rise of the Dragon ($59.95). One problem is leaving the ID card behind in Blade's apartment and hence being locked out. Ain't technology grand? There *is* a way back in, and I don't mean the ledge. See that steam valve up by the corridor ceiling? Steam and electronic hardware don't mix.

And some are having trouble at the Pleasure Dome door. They checked their gun at the behest of the bouncers and now can't get it back. Well, if you'd listened to Slen instead of playing the tough detective, you might have seen the implied threat when you turned the gun over. You need to bribe him with something sweet from your little kitchen. And don't forget to get your claim ticket from the woman in the booth. These two guys are unforgiving.

If you're having trouble with an adventure or role-playing game, or just have something interesting or weird you want to get off your chest, you can write to me at 25 Belmont Ave., Madison, NJ 07940, or via electronic mail on GEnie (P.OLAFSON1) or on Portal (PETEROO).

Flames of Freedom

By Peter Olafson

Flames of Freedom (*MicroPlay/MicroProse*, $49.95) is Mike Singleton's brilliant follow-up to 1990's Midwinter. That role-playing wargame from England was an imposing classic. Flames of Freedom is an accessible one—bigger, deeper, more detailed, and more playable.

Midwinter postulated a partisan-like defense of an ice-bound island in the not-too-distant future. In Flames of Freedom, Midwinter has vanished beneath rising seas, and the scene has shifted to an archipelago of 42 islands (the Slaves) off the coast of Africa, all but one (Agora) occupied by the forces of the Saharan Empire. The empire is assembling an invasion fleet pointed at Agora, and you're cast as an agent trying to bolster Agora's chances by helping liberate the subject islands.

Midwinter was an environment; Flames of Freedom is a filled-polygon world. There are roads with military traffic, palm trees growing beside them, waves lapping at the beaches beside the palms, and plants growing on the sea bottom. There's a spectacular variety of people—you can even design your own character's appearance—with all sorts of agendas. There are more ways to get around than I have room to describe, and more enemies than you care to know.

If you felt the original game lacked direction, Flames of Freedom is as open-ended or as focused as you care to make it. You can launch specific raids (destroying power plants or radio stations, for instance) against each island, undertake a whole campaign, or practice driving vehicles (or fighting in the flying sub).

You may find that a raid keeps you busy for hours at a time, as the folks you must recruit may have their own assignments for you to fulfill before they're won over. Some of them are traitors who'll throw you into jail, then you must escape by finding a jailer vulnerable to your character's strengths. (I typically waited for a woman and used, um, sex appeal. Hey, it was my character's strong point!)

Getting places could be a chore in mountainous Midwinter. There are plenty of mountains in the Slaves, but now movement can be automated, time compressed, and a huge array of speedy vehicles enlisted (provided you find them) for travel in the air, on land, and on or under the sea.

In Midwinter, character relationships were involved, but actual interaction was simple; other people would either help you or they wouldn't. Here, there are several levels of interaction. NPCs may provide information, offer to notify their friends to help you or to take you to other people, run missions themselves, or provide transportation, identification or first aid (not necessarily of top-notch quality). And sometimes you have to persuade them first.

The manual is far superior to Midwinter's, properly emphasizing rules over background. The music, which can be toggled off, is good (notably the driving piece that plays over the titles), and the in-game fractal maps are gorgeous and overflowing with data.

The hellish copy-protection scheme is gone, thank goodness. You still have to identify two pictures from the manual, but now all the pictures are compressed onto six consecutive pages, rather than one per page. And the three AmigaDOS disks can be copied onto a hard disk.

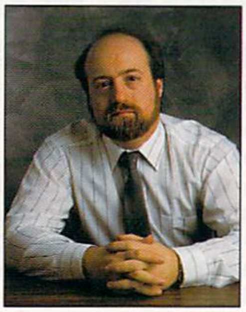
Along with these improvements come some new problems. While speedy and smooth in most respects, the game is prone to slowdowns when more than a few objects appear on the screen. (It might have helped if they'd opted for less complex explosions.)

Combine the variable speed with rather awkward control (Flames of Freedom badly needs an auto-centering option), and you have a game that's most difficult to play at the times when you most need to be its master. It's easy to get caught in endless circles when using the joystick. (The mouse is the best of the three control methods.)

Allowing a player to take over whatever vehicle is near—including the Tiger tank that was just firing at that player—doesn't quite ring true, and some kind of hand-to-hand combat routine should be included here.

Finally, there's that hard-disk installation routine. The option is a welcome one, but the actual routine is the pits. A text file describing the procedure is truncated in mid-example; you have to edit the installation file manually if you want to put the game anywhere other than DH0: or SYS:; and Flames of Freedom apparently can run only if installed in a partition's root directory.

It's frustrating, it's time-consuming, and, yes, it's worth the trouble. Flames of Freedom has some bad habits, but I have no intention of putting it aside. Indeed, I have no choice. ■



HELP KEY

Wanted: 3-D clip art, a talking word processor, and a system to handle huge display and storage demands. Lou finds.

By Louis R. Wallace

A Huge Problem In Playback

Q: *How soon will an affordable hardware configuration exist for the Amiga that will allow playback of broadcast-quality, 24-bit animations at 30 frames per second from RAM or hard disk? Is 30 frames per second possible with DCTV and a 68040 card? It seems that if the Amiga is to be a truly useful desktop video platform, playback at 30 frames per second must be one of its necessary capabilities.*

M. Caldwell
Knoxville, Tenn.

A: What you are describing is an extremely difficult problem to solve. Images of broadcast resolution that are created with 24 bits per pixel are huge—on the order of one megabyte per frame. Without compression, this would require you to have around 30 megabytes per second for your digital video, an amount of data that would demand an enormous amount of display RAM and storage space. But efforts to reach this goal *are* being made.

For example, many people who have attended Amiga shows during the last year have been treated to exhibits of DCTV displaying real-time digital animations. My favorite was done by Interactive Video Systems (IVS), which used an Amiga equipped with IVS's Trumpcard Pro and DCTV to play a multiminute sequence of "Back to the Future" from a hard disk—with audio—in real time.

However, IVS used its own proprietary software and animation file format to accomplish this, and so far the technique to do this remains a secret. But what really made it possible was the fact that DCTV's image format uses a fairly good form of compression, one that can reduce the amount of memory by a factor of 8 to 10, meaning that one-megabyte, 24-bit files become a more useful 100K or so in size.

In the near future (one or two years), the MPEG full-motion chips will become available. MPEG technology promises compression (and real-time decompression) on the order of 20:1 all the way down to 100:1. When this happens, full-motion video from disk, floppy, hard disk or CD-ROM will become a reality on the Amiga (as well as on other computer platforms).

A Word Processor That Talks Back?

Q: *I am an A2000 owner who is dyslexic, and I am searching for a word processor that offers some special features to help me in my word processing. The best solution would be one with which I could speak and spell-check the words while I am typing. A speaking dictionary that could distinguish between identically spelled words for which different pronunciations carry different meanings would also help a lot. Simply put, as well as all the features you would expect in any word processor, I need something where I can point to a word and the computer will speak the word to me. Any suggestions?*

M. Boar
White River Jct., Vermont

A: Well, it would seem that ProWrite (New Horizons) is the answer to most of your needs. ProWrite offers a real-time spell-checking mode that beeps when you enter a word that is not in its dictionary. It will also speak (using the Amiga's voice synthesizer) the entire document or a single word or phrase that has been highlighted with the mouse. It even has a mode that will speak (in real time) what you type, although it works on the character level, not the word level. So if you were typing in "Dear," it would speak "D" "e" "a" "r" as individual letters, but would not speak the entire word. Unfortunately, neither ProWrite (nor any other word processor I know of) offers a "speaking dictionary" that can tell how to correctly speak a word when several pronunciations are possible.

A Search for 3-D Objects

Q: *I have just recently begun to get into 3-D animation on the Amiga, and I am having a ball creating animations with Sculpt and Imagine. The only real problem I have is in the creation of objects to use in my scenes. As I am not an artist (or very patient, I might add), my efforts have been quite primitive. So, can you offer any suggestions as to sources for well-crafted, ready-to-render 3-D clip art?*

J. Planck
Houston, Texas

A: There are quite a few sources for 3-D objects. If you have a modem, you might try the major telecommunication networks such as GEnie, CompuServe or BIX. All have many object files in their libraries ready for downloading. Or, you might try some BBSs in your own area, as they, too, frequently have 3-D objects.

One of the most interesting sources of objects is a specialized BBS called Studio BBS (817/467-3658). Studio BBS (generously operated for the public by Jody Reimers) is entirely dedicated to 3-D objects that are in the public domain. Its libraries include object files for Sculpt, Imagine, LightWave, Videoscape, Turbo Silver and Real3D. Studio BBS asks for an optional donation, and its libraries are constantly being added to by other users.

There are also many commercial 3-D object libraries available. For example, Impulse, the publisher of the 3-D animation package Imagine, plans on releasing an entire series of high-quality 3-D objects to coincide with the release of Imagine 2.0. Polar Arts has a couple of disk sets, including aircraft and spaceships. And *AmigaWorld*'s special products division has commissioned the creation of a large number of 3-D objects that are offered for release through our 1992 Animation & Video Special Issue. ■

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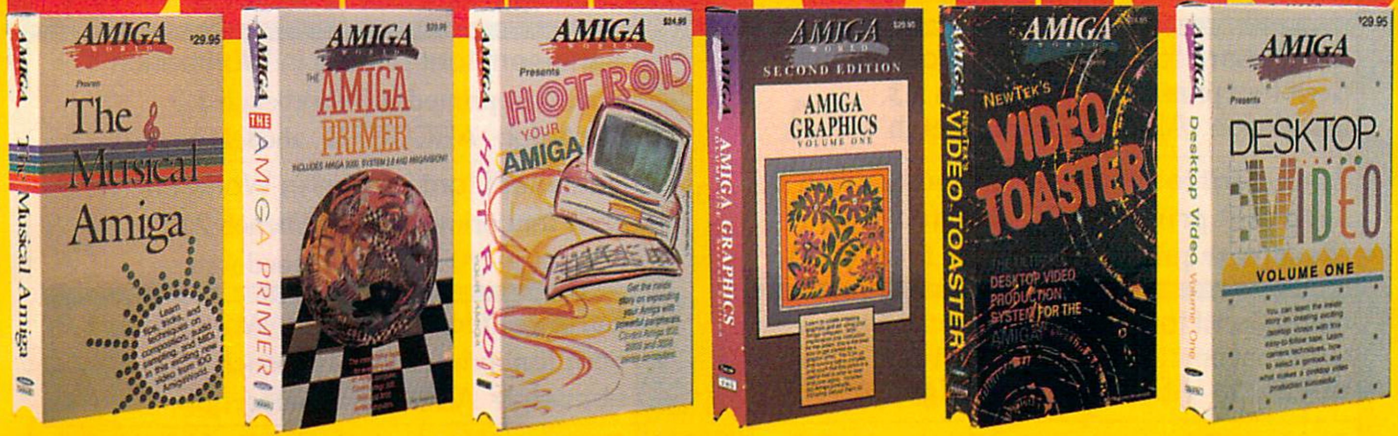
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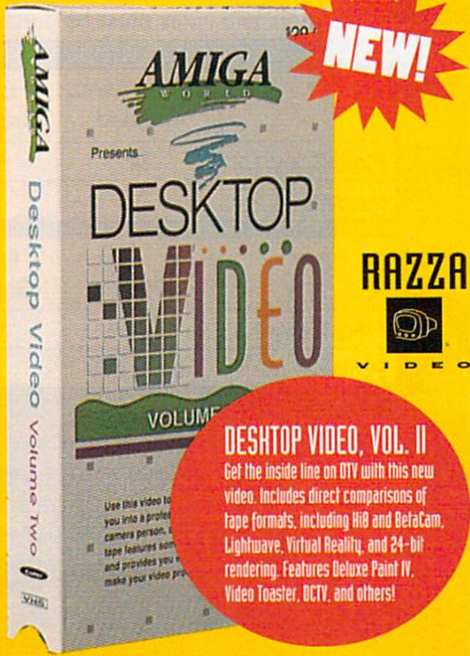
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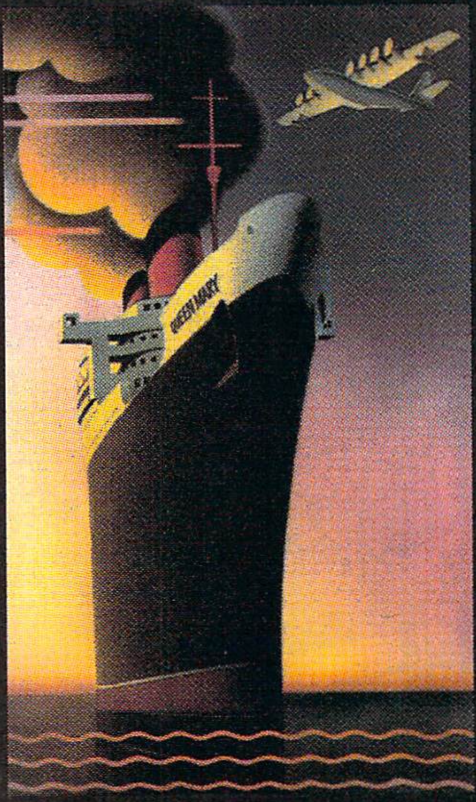
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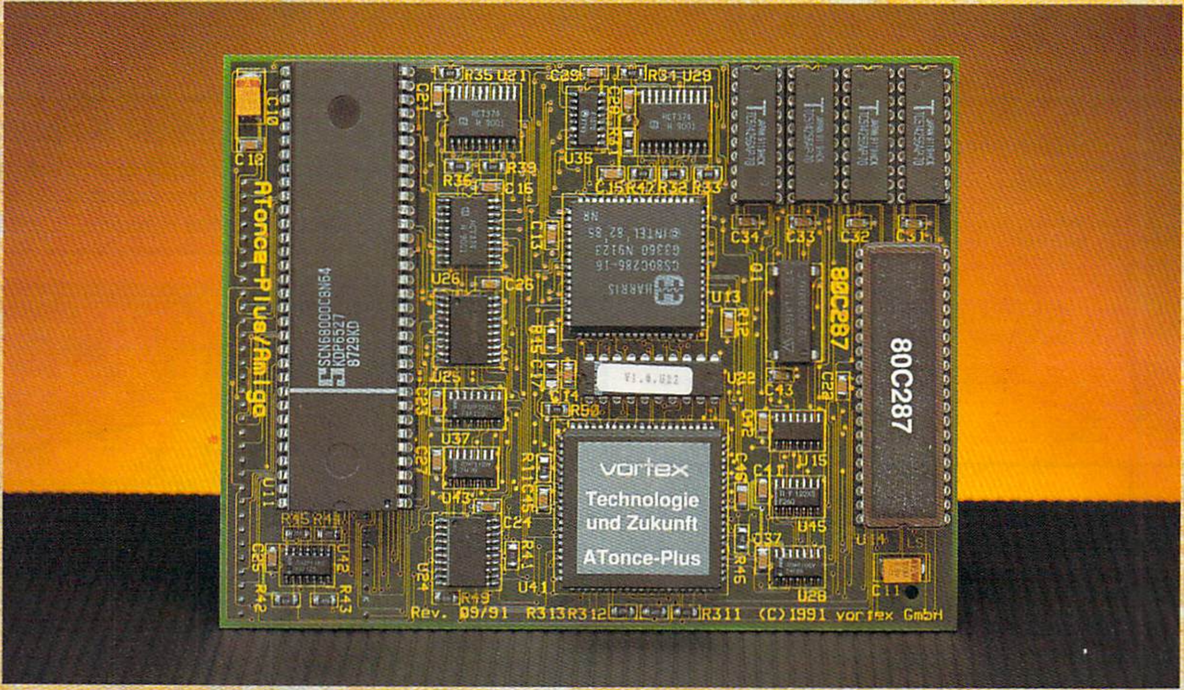
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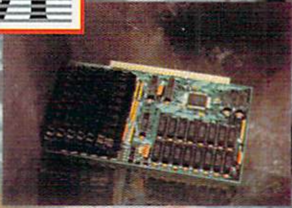
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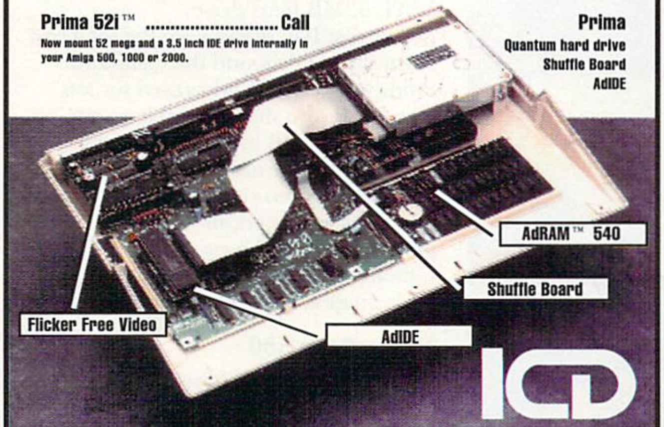
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From p. 23.
$15 \times 5\frac{3}{4} \times 2\frac{1}{2}$ inches, with several inches extending past the back of the computer. The green LED located near the front of the enclosure indicates hard-drive activity. Inside the enclosure, I found a single 100-pin, A2000-type expansion slot and the DataFlyer SCSI host adapter, a half-length card. The unit comes with a half-height Quantum 40MB hard drive mounted at the back of the enclosure. The system I reviewed came with a DataFlyer RAM option ($129), a DataFlyer power supply option ($69), and a SCSI pass-through option ($14.95) that provides a 25-pin SCSI connector on the back panel.

You can obtain DataFlyer RAM configured with .5 , 1, or 2MBs by using 256K SIMMs. With 1MB SIMMs, the possible memory configurations are 2, 4, or 8MBs. DataFlyer RAM plugs into a 100-pin header located on the DataFlyer SCSI host adapter.

The DataFlyer 500 power supply installs inside the enclosure and powers the entire system. This switching power supply does not need an on/off switch, as it automatically powers up when the A500 is turned on. The DataFlyer RAM power supply option ($29) is an external supply that you use only to power DataFlyer RAM. In this case, the A500 powers the DataFlyer SCSI host adapter and the associated hard drive.

The DataFlyer 500's set-up software consists of a command-line window presenting a series of questions for response. This setup successfully leads you by the hand through both low- and high-level formatting, partitioning, and Workbench and AmigaDOS installation.

The basic DataFlyer 500 is a low-cost, no-frills hard-drive system that performs most competently. Performance with a Quantum 40MB hard drive was very good, although its speed did drop off somewhat with DMA and CPU contention turned on. Installing additional peripherals will somewhat offset the initial low price of the system.

The Trumpcard Experience

Interactive Video Systems' (IVS) Trumpcard line of products is designed to offer a variety of options. What's more, IVS's hard-drive set-up software, common to all of their hard-drive systems, is the best I have seen. Its point-and-click user interface lets you create and size hard-drive partitions by simply dragging the mouse. It supports all known file systems, including the old file system, the fast-file system and AMax.

Trumpcard 500 AT

The Trumpcard 500 AT ($275.95) has a plastic housing that matches the A500's styling, coloration, and profile. About $5\frac{1}{4}$ inches in width, the enclosure's sloping front panel sports a red power LED and a green hard drive-activity LED. Its rear panel is fitted with a five-pin DIN connector for an optional external power supply. To disassemble the unit, simply remove the eight screws from the bottom of the case and lift the cover off. You can then pull the main circuit board right out.

The unit's full-length circuit board utilizes all surface mount components, located underneath. Eight SIMM sockets, the hard drive, and the associated connectors are all mounted topside. A half-height, $3\frac{1}{2}$-inch hard drive mounts on four nylon standoffs to the top of the board. The on-board memory expansion uses 1MB SIMMs that can be configured as either 2, 4 or 8MBs of Fast RAM. An autoboot enable/disable jumper is provided if you are still using Kickstart 1.2. You will have to set a RAM-disable jumper if you want to run the included RAM test program.

As with all of IVS's hard-drive host adapters, you can disable the autoboot simply by putting a bootable floppy disk into drive DF0:. The system then boots from the floppy, and the hard drive is not mounted, remaining unrecognized by the system. You can also hold down the left mouse button while the system boots from a floppy disk. In this case, your system recognizes the hard drive, and all its partitions will be mounted; however, the system will boot and run from the floppy drive.

Trumpcard 500 AT differs from all the other systems in this report in that it utilizes an IDE (Intelligent Device Electronics) disk drive. Most other Amiga hard-drive host adapters support the SCSI system. Like SCSI drives, IDE drives provide on-board intelligent controllers. While the Trumpcard 500 AT does not provide for an external drive cable, you can modify its enclosure to support a second drive. Additionally, IDE hard drives are inherently slower than SCSI drives, although the Trumpcard 500 AT still puts in a respectable performance on the speed tests with its supplied Quantum LPS 52AT, 52MB hard drive.

Low-cost IDE drives keep the total cost down. I recently found the Quantum Prodrive LPS 52AT advertised for less than $180. You should be able to put together a 50MB hard-drive system based on Trumpcard 500 AT for less than $400. When you consider that the system includes built-in 8MB RAM expansion, comes with excellent support software, and has better-than-average performance, it merits a best-buy rating.

Trumpcard 500

IVS's original hard-drive and memory-expansion system for the A500, the Trumpcard 500 ($189.95), is an all-metal boxy enclosure with sloping front. It measures $9 \times 7 \times 3$ inches, making it slightly taller than the computer. The hard drive mounts upside down directly onto the top cover, which comes off easily upon the removal of



The IVS line of hard disks and RAM expansion for the A500.

four screws. Like the 500 AT, the sloping front panel sports a red power LED and a green hard drive-activity LED, and the rear panel has a five-pin DIN connector for an optional external-power supply. It also has a cutout fitted with a plastic insert for an optional 25-pin external SCSI connector.

Trumpcard 500 uses the same hard-drive set-up software as all of IVS's host adapters, with the same booting options. Inside the housing is a two-slot expansion chassis that accepts a pair of half-length, A2000-style, 100-pin expansion boards. One of these boards, IVS's Trumpcard, comes with the system. The second slot is intended for Meta4, IVS's 4MB RAM-expansion board that accepts SIMM modules. Meta4's memory configurations are 512K or 1MB with 256K SIMMs. With 1MB SIMMs, Meta4 comes with 2 or 4MBs of fast RAM. Based on current memory prices, I recommend 1MB SIMMs.

Trumpcard is IVS's bottom-of-the-line SCSI host adapter. Nevertheless, it does a competent job. Trumpcard 500's performance with the A500 and a Quantum 40MB hard drive was quite respectable. The Trumpcard 500 provides for an external, 25-conductor SCSI cable to the enclosure's rear port. Like all SCSI host adapters, you can daisy-chain as many as seven SCSI devices to the system. In addition to fixed SCSI hard drives, Trumpcard 500 also supports removable media drives such as the Syquest system.

Trumpcard 500 is a good do-it-yourself system that maintains upward compatibility with the A2000. With its moderate price tag, good performance and supporting software, Trumpcard 500 is well worth considering.

TRUMPCARD PROFESSIONAL

Trumpcard Professional 500 ($279.95) utilizes the same metal enclosure as Trumpcard 500, with a built-in, two-slot expansion chassis. It differs from Trumpcard 500 in that it comes with IVS's Trumpcard Professional SCSI host adapter. As a result of its high-speed design, Interactive Video Systems does not recommend the use of the 25-pin external SCSI cable. Instead, Trumpcard Professional makes use of a matched set of on-board, 50-pin SCSI connectors. You can daisy-chain additional SCSI devices via 50-conductor flat-ribbon cable. The board has room for a Meta4 fitted with up to 4MBs of expansion memory. I consider the Trumpcard Professional 500's performance with a Quantum 40MB hard drive to be the best of this group. ►

A500 Hard-Drive Test Results

I used MKSoft's DiskSpeed 3.1 to test these hard-drives. With Workbench 1.3 and its sundry files installed on each drive, I attempted to find out how many kilobytes each host adapter could create, read, and write in one second when using a 256K buffer. In the Table 1 columns, the figure to the left of the slash represents the results with no other disk activity, while the right-hand figure reflects a multitasking environment.

The data in Table 2 shows how many files each of the system's drives was able to create, open and close, scan, delete, and seek/read in one second. As in Table 1, the inital figure listed tells you the results without DMA and CPU contention, and the second figure shows you what happens with these extra demands.

Finally, the results of two "real-world" tests appear in Table 3, the first column showing how long each system takes to autoboot from a cold start, and the second column how long it took to build a new index on one field within a large database file.

Table 1. Kilobytes per second, using a 256K buffer.

System	Create	Read	Write
Comspec SA with 48MB Seagate ST-157N	55/30	152/42	61/41
DataFlyer 500 with 40MB Quantum	148/60	428/167	191/76
Trumpcard 500 with 40MB Quantum	238/99	392/152	393/152
Trumpcard AT with 52MB Quantum	299/194	435/264	464/268
Trumpcard Pro 500 with 40MB Quantum	272/138	559/292	549/261
GrandSlam 500 with 40MB Quantum	273/137	562/300	546/261

Table 2. Number of files per second.

System	Create	Open/ Close	DirScan	Delete	Seek/ Read
Comspec SA	5/1	11/3	52/9	13/2	13/2
DataFlyer 500	8/5	31/14	133/54	30/15	195/77
Trumpcard 500	9/5	32/15	102/41	29/15	196/73
Trumpcard AT	12/8	29/15	111/51	62/29	177/78
Trumpcard Pro	8/5	38/16	132/51	29/17	191/73
GrandSlam	9/5	39/18	132/54	29/18	191/80

Table 3. Time taken to autoboot and build a new index.

System	Cold Boot	New Index
Comspec SA	25 sec.	52 sec.
DataFlyer 500	24 sec.	41 sec.
Trumpcard 500	29 sec.	37 sec.
Trumpcard AT	24 sec.	37 sec.
Trumpcard Pro	29 sec.	41 sec.
GrandSlam	29 sec.	41 sec.

GRANDSLAM 500

GrandSlam 500 ($369.95) inhabits the same metal enclosure as Trumpcard 500. The difference is that GrandSlam 500's built-in expansion chassis only has one A2000, 100-pin slot, which is equipped with IVS's Grand Slam SCSI host adapter. GrandSlam evolved from three IVS products, Trumpcard Professional, Meta4, and Printerface. It is actually a Trumpcard Professional SCSI host adapter, an 8MB RAM-expansion card, and an auxiliary Amiga parallel port on a single, half-length, A2000-type expansion card.

Since it uses the same high-speed design as the Trumpcard Professional SCSI host adapter, IVS applies the same restriction against the use of a 25-pin SCSI cable, using instead a pair of 50-pin SCSI connectors. GrandSlam 500's performance with the A500 and a Quantum 40MB hard drive was comparable to that of Trumpcard Professional 500, which was the best of this group.

All of GrandSlam's operational features, autobooting, hard-drive installation, support software, and SCSI network support are the same as for Trumpcard Professional. You can install up to 8MBs of Fast RAM, and memory comes in 2, 4, 6, or 8MB increments with 1MB SIMMs.

GrandSlam 500 adds a second parallel port to the A500. Although from an electrical point of view its parallel port could operate bidirectionally, the Amiga's operating-system design limits its operation to output only. With the GrandSlam 500's extra parallel port connected to a printer, the Amiga's original parallel port is available for use by devices such as video digitizers, sound samplers, and scanners.

GrandSlam 500 is a good do-it-yourself, high-performance system that maintains upward compatibility with the A2000.

TEACHER'S TOOLKIT

TTR DEVELOPMENT

No more pencils, no more books.

By Neil Randall

TEACHERS SPEND A LOT of time on administrative and organizational tasks. There are grades to record, lessons to prepare, lists to keep, reports to compile, and all of these detract from the teacher's main job, which is, after all, to teach. ***TTR Development***'s Teacher's Toolkit ($54.95), a teacher-oriented record-keeping package, lets your Amiga assume some of the burden.

In its favor, Teacher's Toolkit is teacher designed and programmed, and it's clear from the result that the author continually had himself as teacher in mind. The potential problem with a one-person design and development team is that the package may suffer from a kind of personalized tunnel vision, but the author has largely risen above these concerns.

TIME RELEASED

Let's begin by concluding. Teacher's Toolkit will unquestionably assist teachers in organization and record keeping. It is flexible, usable, and far from overburdened with marginal features. There are, however, two caveats here. First, the program is slow, even if you have a hard drive. On an A500, some of the reports and graphs take ages to appear, and waiting for new screens to show up is aggravating. Second, and more important, the Toolkit assumes regular and continual use.

As its name suggests, Teacher's Toolkit is more than just a grade-recording program. The grades module (called Gradebook) is certainly the most important part of the package (it can be booted by itself from disk #2), but there is also a text editor, an appointments calendar, a telephone directory, and, most interestingly, a lesson planner. The text editor is a rudimentary word processor (but it works), the calendar is more than sufficient for most needs, and the telephone directory is really a small database with an autodial function.

The Lesson Planner is an extremely good idea, more sophisticated than the smaller utilities, but just as easy to use. Its strength, like the rest of the program, is in forcing you to make concrete decisions about what you're going to do, then helping you stick with those decisions. This utility won't plan lessons on its own, but by the time you've worked your way through it, the lesson should be clear in your mind. It also lets you combine strategies from earlier successful lessons, helping you avoid continually reinventing the wheel.

Toolkit divides each lesson into eight stages: Objective, Equipment, Motivation, Overview, Presentation, Check,

Continued on p. 98.

dataTAX

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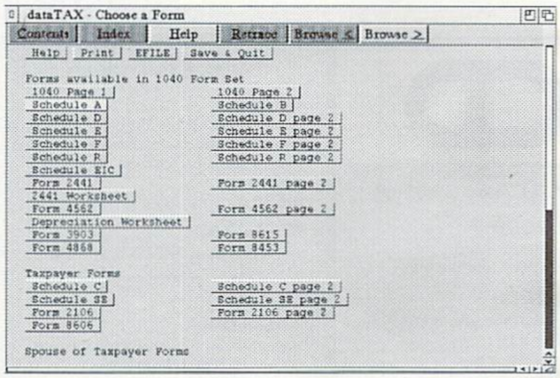
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A Canadian version of dataTAX is also available for C$ 59.95.

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Circle 55 on Reader Service card.

Circle 34 on Reader Service card.

From p. 94.
Practice, and Review. Each stage is given a corresponding button on the Lesson Planner screen. Click on the button, then type whatever you want in the bottom half of the screen. At any stage, you can call up the corresponding stage from an earlier lesson, for copying or editing. If your motivation for a lesson from last month worked well, for instance, you can use it again, or modify it slightly.

The Lesson Planner illustrates the Toolkit's intended long-range use. By storing lesson plans over several years, you can re-use the best, modify the next best, and combine several successful ones to create a brand new one. You aren't constrained to use past lessons, but as a teacher you are well aware of the need for re-using successful plans, and the Planner lets you do so. The extremely effective Planner may well be the main reason for buying this package, and its designer would do well to develop it even further.

Keeping Score

The core of Teacher's Toolkit, however, is its Gradebook module. As with all record-keeping packages, the question is whether or not you will use it. The package must be easy enough to *invite* repeated usage, and it must do so by making the results worth the effort.

At this, I give Teacher's Toolkit a grade somewhere in the B range, perhaps as high as B+. One of the problems, mentioned above, is that the program moves from screen to screen slowly. Another is that learning to use a good spreadsheet will ultimately provide greater flexibility, easier data entry, and more useful charts and reports. Toolkit's positioning, half-way between the drudgery of manual record-keeping and the intimidation of a full-fledged spreadsheet, demands an interface that is easy to use yet yields significant results.

The basic Gradebook screen shows a collection of rows and columns. In the left-most column are the students' names, sorted alphabetically. The next columns (as many as you want, but only five appear at once on a given screen) show the assignments and their associated grades. The final column shows the total raw or average score for each student. At the bottom of the screen are interface buttons to move to the Graph, Records, or Student Info screens, and arrows for moving around the spreadsheet.

You can customize the spreadsheet according to individual class requirements. The Class Selection screen lets you add new classes, and (a nice touch) use names and information from previous classes. Then you customize the marks requirements with the Setup menu to weight each type of assignment. By clicking on the Score button, or on an empty title cell, you can enter the name, date, and weighting information for specific assignments. On the spreadsheet itself, you enter the grades for each student, as well as absentee information. All of this information interacts when Gradebook creates its charts and reports.

Teacher's Toolkit's 11 report types provide information on the entire class, on individuals, and on particular assignments. Summary reports offer the averages in each assignment category for either the whole class or for one student, yielding letter grade, absences, and tardiness. Attendance reports reveal only absences and latenesses, while Everything reports list all test results, attendance information, extra credit, and any other recorded result. At parent-teacher interview time, you can use the Class Everything report to print information about the entire class.

The Graphs option takes the class, student, or test information and displays it in line or bar graphs. With graphs, you can compare one student's results against class averages, or you can show the grade patterns occurring per class or per assignment. The graphs seem limited in what they do, but hidden beneath them are more specific results. On a class-based Grade Pattern graph, for instance, which shows how many students earned each grade (from A+ to F), you can click on a specific grade to get a list of which students earned that grade. This kind of detail is useful for internal reporting.

Graphs and reports tend to be slow (some class reports are painfully so), but obviously you're not going to use them all that often. Like the rest of this package, the interface lacks some smoothness. In future versions, I recommend interface streamlining second only to improved program speed.

High Marks

That said, Teacher's Toolkit is impressive. For teachers willing to learn the program and commit themselves to its use, it will almost certainly prove invaluable. It is essentially crash-free (I crashed it only twice, and always when I was roaming around, clicking repeatedly and at random), and it delivers what it promises.

The Rejuvenator

Expert Services

By Gary Ludwick

BY DEFINITION, TO REJUVENATE something is to restore its youthful vigor or appearance. A better name for The Rejuvenator ($419.95), ***Expert Services***' A1000 upgrade board, might be the ReAnimator...because for many of us, it brings our old standby back from the dead.

As the proud owner of three A1000's, I had been content over the years to smugly watch the A2000 series increase in popularity, safe in the knowledge that there was really very little that those machines could do that mine couldn't. Then the hardware cards started appearing: the flickerFixer (MicroWay), hard drives and controllers, the Video Toaster (NewTek), and finally the A3000, with its Extended Chip Set (ECS) and Kickstart ROMs. The writing was on the wall: My beloved A1000s were becoming obsolete.

While planned obsolescence is a fact of life with many computer companies, the Amiga community is fortunate in having more than just a few hardware mavens who live to challenge the words "it can't be done." That's how Greg Tibbs came to design The Rejuvenator, and why your A1000's life expectancy can increase.

A1000 in A2000's Clothing

What will The Rejuvenator do for your A1000? It will, in most respects, make it the operating equal of any A500 or A2000. The board adds several capabilities and features to your A1000. With it, you get the new one- or two-megabyte ECS Agnus chip, a battery-backed clock, an A2000 video slot, one or two megs of additional chip RAM, a 1.3/2.0 ROM socket, and compatibility with the new ECS Denise chip. In short, whatever support and upgrades become available for the A500 or A2000, they will also be available for your A1000, as long as you install The Rejuvenator.

The Rejuvenator replaces the A1000's daughterboard, which, for those of you who have never opened your machine, is a small board mounted above the main (mother) computer board and connected to it by about 20 to 25 hard pins that slide into the daughterboard's molex connectors. Because of the way The Rejuvenator has to be mounted on the motherboard, it is necessary to

completely dismantle your A1000, removing the disk drive, the daughterboard, and the motherboard from the case.

While installation is not an especially difficult job, it is not one for a person who is all thumbs mechanically or a complete novice electronically. Although there is no soldering (or desoldering) involved, installing the board correctly can be a little frustrating. Patience and care will see most people through. Be warned, however, that a lack of either could destroy both The Rejuvenator and the motherboard. If in doubt, pay an experienced technician to do it.

It's Alive!

My first experience with The Rejuvenator kindled mixed feelings. With the brand-new 2.0 Kickstart ROM in the socket provided, I was thrilled to see the new, animated Kickstart screen asking for the Workbench disk. Moments later, however, after it had digested Workbench, a warm reboot (Ctrl/Amiga/Amiga) locked up the machine. A thorough search turned up no installation errors, and letting the machine cool off for 10 or 15 minutes made the system functional.

Eventually, I installed the board in a different A1000, and the problem ceased to exist. Apparently some component in the first A1000 had changed value just enough over the years to make it intolerant of warm chips on The Rejuvenator. Unfortunately, this could conceivably happen to anyone. Fortunately, Expert Services offered excellent support—an important consideration when you are troubleshooting hardware long distance.

Makes Friends Easily

Over the years, there have been some strange memory-expansion devices developed for the A1000, both internal and external. The Rejuvenator is compatible with some of them, but not all. For instance, the presence of my Pacific Peripherals expansion cage on the expansion bus causes The Rejuvenator to lock up. Expert Services is aware of the problem, but has not found a solution.

On the other hand, internal expansion, such as the Insider I & II and the Spirit boards, seems compatible. Similarly, my Xetec SCSI host adapter living on the expansion bus presented no problems. The Rejuvenator provides two sets of jumper pins that let you reset memory addresses to avoid contention between devices. Expert Services also provides custom PAL chips designed to your own specifications.

Finally, there are several ways that The Rejuvenator can deal with the two current versions of Kickstart. The board is shipped with a jumper that lets you boot with an internal Kickstart ROM, or, by installing a small SPST micro switch on the A1000's case, with a Kickstart disk. Add $60, and Expert Services will provide a double ROM-socket adapter that provides space for both 1.3 and 2.0 ROMS, again with an external toggle switch for selection purposes.

Although The Rejuvenator comes with a built-in edge-card connector for video devices, you should wait before ordering a Video Toaster. Essentially, the connector comes wired for use with flickerFixer-type boards and genlocks. Fitting other devices is a possibility, but you will have to run special jumpers from the slot to the required signal sources on the motherboard. Expert Services can tell you where to find many of these signals, but you are essentially on your own here.

The Eternal A1000

For A1000 owners, The Rejuvenator board is perhaps the most exciting piece of hardware to come along since the hard disk. It promises a much longer and moreproductive life for the A1000, and it "rejuvenates" with relative ease.

If there is a weak point to The Rejuvenator, it has to be the installation manual. While the text is relatively clear, both the number and quality of the photographs leave a lot to be desired. More photographs and diagrams would go a long way towards easing the installation process.

In the final analysis, however, The Rejuvenator is a superbly designed and engineered piece of equipment that is worth every cent of its price. It provides a new lease on life for the thousands of tenacious A1000s out there and ensures a firm foothold for the future. For less than $500, that's a bargain any way you look at it. ►

KwikStart II

DKB Software

Give your A1000 a split personality.

By Gary Ludwick

IF YOU COULD care less about Super Agnus chips and large amounts of chip RAM, but want to run AmigaDOS 2.0, take a look at KwikStart II ($99.95), DKB Software's nifty little add-on board.

KwikStart II gives you the ability to run your A1000 from Kickstart ROMs. It not only eliminates the Kickstart disk, but also provides sockets for both 1.3 and 2.0 ROMs. With both versions of Kickstart available and switchable from the keyboard, there should never be a compatibility problem between the software you're using and any version of Kickstart.

Have Gun, Should Travel

Installing KwikStart II requires opening the A1000 and removing the internal disk drive and the daughterboard. While plugging the board into the 68000 socket and transplanting the 68000 chip to a socket on the board are relatively simple, the rest is not.

KwikStart II comes with its own custom PAL chip, which replaces the one on the daughterboard. Unfortunately, the Amiga's PAL chips are hard-soldered to the board (no sockets) and must first be desoldered. Even with the proper tools, this is a difficult job—one that makes it easy to damage the daughterboard. DKB strongly suggests, and I concur, that you pay an expert to do it. It is most definitely time and money (maybe $10 to $20) well spent.

Once the old PAL chip is removed, a new socket is soldered in its place and the custom PAL chip is installed. Then there are just two small wires to solder, and the job is done.

The KwikStart II board provides sockets for two Kickstart ROM chips. You can install 1.3 and 2.0 immediately, or, if you prefer, install only one. KwikStart II affords a jumper that allows you to toggle between two ROM chips, or between one ROM and disk-based Kickstart.

Decisions, Decisions

In just seconds after a cold start, the screen displays the request for Workbench (unless you already have a Workbench disk in DF0: or an autobooting hard disk on line, in which case it goes right into your startup-sequence.)

Want to change Kickstart versions? Simply perform a warm boot (Ctrl/Amiga/Amiga keys), holding the three keys down more than five seconds. KwikStart II will toggle either to the alternate ROM or to disk-based Kickstart, depending on the jumper setting you select.

Even though DKB recommends professional installation, the manual accompanying the board is clear and well written, providing all the necessary diagrams. There's even a good troubleshooting section for those who know how to use a volt/ohm meter. Telephone support is good, for the phones are manned by technical people who know the board.

For A1000 owners, KwikStart II provides the cheapest, easiest way to get into the 2.0 operating system without the hassle of Kickstart disks. Additionally, because there is software out there that will never run with 2.0, having instant access to 1.3 and disk-based Kickstarts makes KwikStart II a real godsend.

B A C K T A L K

CANDID RESPONSES TO *AMIGAWORLD* REVIEWS

An Unreasonable Facsimile

We were distressed to see our ClickFAX product reviewed with the implication it was less than it should be (see Dec. '91, p.88). ClickFAX is a high-quality, high-performance system; the review is misleading, often to the point of being absurd. We'll address just a few of the errors.

Regarding price, the Amiga business market is tiny, and the price is low for the cost of the system and its performance. The reviewer apparently knows little or nothing of economies of scale or the cost of development.

The reviewer was told to use a desktop-publishing program to generate the best-quality faxes. He used DPaint, which is not a DTP tool, and he then complained when the result was less than optimum.

The reviewer couldn't get text formatting to do what he wanted, and he didn't understand the "truncate" option, which allows wide-formatted ouput, such as spreadsheets, to encode properly. He said he added "hard returns" in his word processor. This indicates that he wasn't using ASCII output, but word-processor files, which also gives a clue as to why he couldn't get his formatting right. The formatting works fine. The reviewer should have asked us when he had questions; we certainly have answers!

His statement that ClickFAX was "barely adequate for sending pictures and totally inadequate for sending text" is nonsense, as clearly shown by faxes we've sent to *AmigaWorld* using multiple fonts, graphics, imported text, and cover sheets.

We felt that the reviewer was "stuck in the past," where highly integrated software is the norm; his PC-related remarks confirmed this. ClickFAX is designed to work with the many excellent DTPs and text editors already available. It would be absurd for us to burden ClickFAX with weak substitutes.

We're inviting anyone who doubts the ability of ClickFAX to make beautiful faxes incorporating text and graphics, provide attractive cover sheets, or otherwise work well to call us and ask to have a demo faxed to them. Please call us and get the facts before you draw any conclusions based on the ClickFAX review run in *AmigaWorld*.

Ben Williams
Black Belt Systems

Out of Context

Regarding the review of Context Bible (see Dec. '91, p. 92), I have a few corrections. First, there has always been a help file included with Context Bible. Also, connections between a diagram and the Context Bible are done in an ARexx requester. Furthermore, Neuralink's correct zip code is 79490 (the wrong ZIP was published in the manufacturers' address list).

Jack Seay
Neuralink ■

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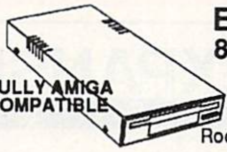
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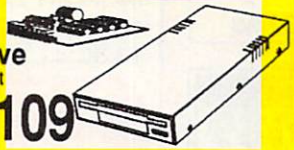
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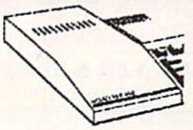
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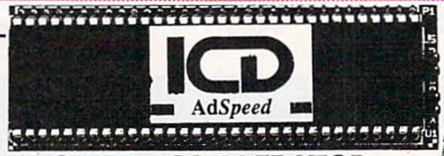
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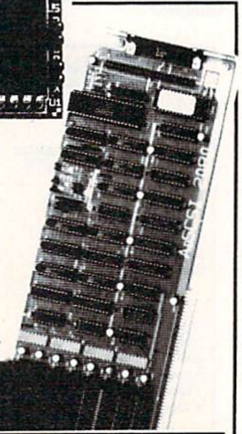
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We have been the official Public Domain Library of all of the best Amiga magazines. Find out why these magazines choose us! Each of our disks are jam packed with only the best programs. The first two letters on each disk indicate the orientation of the disk; DD# advanced--requires thorough knowledge of AmigaDOS and programs often contains source, VO# video related programs/utilities, WB# general interest - most programs can be run from the workbench, and FD# games and entertainment. Order our disk based catalog and receive a coupon for a complimentary volume with your next purchase.

Featured Disk

WB71A&B: The A64 Package - A very complete Commodore 64 Emulator. Supports any CPU and is fully compatible with WB2.0. Now that you've traded in your C64, don't loose all that software that took you years to compile. This software emulator actually runs faster than a 64! Amaze your C64 friends! Two disk set, counts as two.

New Disks

V04: Video & Anim - Video_DB will catalog all of your videotapes. Slate is a sharp graphic of a slate for your productions. CyroUtils splits, makes and gives info about ANIMs. RTAP lets you play large ANIMs on small memory machines.
V03: Image Utils - let VideoToolsOnTap let you tap into the video power of your Amiga for fades, color and greybars as well as a plethora of other indespensable video functions. TitleGen will do professional crawling titles. JPEG converts JPEG<->24-bit IFF with *amazing* compression. ImageLab performs special effects on IFFs.
V02: Stillstore - Used to create the "over the shoulder" graphic inserts ala the 11:00 news.
V01: Graphics - Picbase will let you view and track ALL of your IFF pictures over all of those floppies! Freepaint is a Deluxe-Paint workalike. Agraph is a powerful utility to produce snazzy graphs.
FD72: Sword of the Warlock - This is a demo version of a great public domain graphic dungeon adventure game. The adventure spans three diskettes and allows two players to go adventuring. The game has a 'Bards Tale' feel to it. Three disk set, counts as 2. Requires 1 meg of RAM and 2 floppy drives or HD.
FD71A&B: Star Trek: TNG Trivia Challenge - So you think you know *The Next Generation*, huh? Complete with *fantastic* sampled sounds and digitized images, this game even looks and sounds like a genuine Star Trek terminal! VERY thorough and complete! Two disk set, counts as two.
FD70: SpaceGames - Contains AmiGoids, >finally!< an Asteroids game that takes advantage of the Amiga--totally configurable with great sound and grpahics. In Cosmostruction the object of the game is for each Cosmostruction team to acquire the most points while construction energy ducts between the space station and planetoids.
FD69: MindGames - Had enough of shoot-em up blasting games? Relax and let these 21 games exercise your mind instead of your wrist.
FD68: Potpourri - Eternal Rome is a strategic simulation of the Roman Empire including military, diplomatic, political, economic and social factors. Lord of Hosts is a board strategy game for 2 players. In Moonshine, you've got to get the hootch across the state line--a great rolling, scrolling driving game!
FD67: Arcade - Includes Llamatron a well-done 'Robotron' clone. Hate is a "terrific" commercial grade Zaxxon clone with multiple levels/worlds and smooth diagonal scrolling...a 10!
FD65: GameDemo1 - Contains playable demos of Atomino and Turrican II
FD64: Games - Wizzy's Quest - a "great" 50 level game with great graphics, Cubus - a 3-dimensional Tetris type game (rotate and move in 3 dimensions). Husker Du - Colors and pattern rather than shape in this Tetris-esque game; 5 screens and 3 levels of difficulty. Requires Fat Agnus (1 Meg of Chip)
FD62: PomPom Gunner. An extremely smooth and well done World War II gunner simulation. Requires 1 megabyte of memory.
WB107A&B: Educational - Drawmap is a program that generates representations such as hemispherical views, and orbital views of the Earth's surface, complete with national boundaries. Screens can be printed or saved to disk as standard IFF files. Full user-configurable online help facility. 68020+ version included. 2 disk set, counts as 1!
WB106: Home Manager - This is a great all-in-one address book with an autodialer/notepad/to-do list/appointment scheduler/home inventory database and an important phone number dialer. *Slightly* cripped demo version.
WB105A&B: Workbench 2.0 Extras #2 - See the top right of page 2 for more info on these priceless utilities to make Workbench 2.0 fly!
WB104: GrabBag - Q&A Trivia (requires AmigaVision) is a trivia game for 1/2 players...add your own questions to customize the difficulty level! Sysinfo is great for telling you how fast/slow your computer is, what boards are installed, chipsets, etc. AmiGazer will plot stars in the heaven from any position on earth complete with magnitudes and constellation identification.
WB103: Music - Contains 12 "great" Soundtracker/MED music MODules...complete with programmable/shuffle player...8 bit audio never sounded so hot! Two disk set counts as two.
WB102: Communications - Contains the tour-de-force programs NComm 1.921 and VT100-29B. Automatic Zmodem protocols, XPR protocol support, full VT100 emulation. NComm's script language is so powerful it comes with a script file that creates a full-featured BBS system.
WB101: Chemesthetics - is a program that displays molecules as a calotte model. This kind of display contains a certain esthetic attitude, even extremely poisonous molecules like nicotine and dioxine look quite nice.
WB100: CaligariPRODemo - Can't afford $3,000+ to see if the granddaddy of 3D rendering software is for you? Then try the demo version of this renowned modeler that the pro's rely on! No built-in save function, requires 68020+ processor.
WB99: Lifestyles - Includes AGene--family tree program that tracks up to 600 people/marriages/etc, Landscape is a backyard CAD program to create gardens/landscapes, Loom simulates an 8 harness loom; experiment with pattern design in an instant feedback environment.
WB98: Business - Includes BBaseII a nice, powerful database; BizCalc--a personal or mortgage loan calculator with amortization capabilities, Loop--a flowchart maker, Formmaker - design professional looking forms on your Epson LQ-2500 compatible printer.
WB96: Dupers - Contains XcopyIII & Nib which will backup copy-protected programs. FreeCopy removes copy protection from several programs, and SuperDuper will crank-out fast AmigaDOS copies.
WB95: Checkbook Accountant 2.1 This program is definitely commercial grade; we've seen many checkbook programs and this is absolutely the best. Full budgeting, transaction recording and report generation.
WB93: Workbench Extras #2 This disk contains the utilities that Commodore should have shipped with the Amiga; VirusX4.0, Snap, FixDisk (recover corrupt/deleted files), Disk Optimizer (floppy & hard), MachIII (screen blanker, hotkey, mouse accel., macro, clock utility), GOMF (a gurubuster)and PrintStudio.
DD82: Unix - Contains a working demo of Minix - a Unix workalike. Minix is system call compatable with V7 of Unix, supports multitasking and multiple users and many more features too numerous to list here.
DD81: ARexx Tutorial - Includes several sample Arexx scripts and sample programs. Also includes APig; a library that gives you access to Intuition from within Arexx scripts.

Other Great Disks

FD5: Tactical Games - BullRun - a Civil war battle game, Metro you play the role of a city planner. Build wisely and your system will be a success, but poor planning will lead to disaster and financial ruin. Very very habit forming.
FD6: GAMES! - This disk is chock full of games including; Checkers, Clue, Gold - A new slide the pieces puzzle, Jeopard - An enhanced version of Risk, RushHour - Surprisingly addicting, and SpaceWar - Best described as a cross between Combat-Tanks and asteroids.
FD7: PACMAN - This disk contains several pacman type games including; PacMan87, MazMan and Zonix.
FD9: Moria -. This has great graphic controls, multiple spells, similar to Larn and Hack. Play time several weeks!
FD10: HackLite - A dungeon adventure game. Considered a must-have classic. This is the second release of this game on the Amiga. Great graphic interface. Play time several weeks!
FD11: Las Vegas and Card Games - Las Vegas Craps - The best Las Vegas Craps simulation every written for any computer. Contains extensive HELP features, Also Thirty-One,VideoPoker and more.
FD12A,FD12B: Star Trek, The Game - This is by far the best Star Trek game ever written for any computer. It features mouse control, good graphics, digitized sound effects and great gameplay. Counts as 2 disks. Req. 1Mb and two drives (or hd).
FD13: Board Games - contains multiplayer Monopoly, Dominoes, Paranoids, and others.
FD14: Dungeon Master Hints and Arcade Games - DM maps, spells, item location, and hints and more, also on this disk, Hball - an arkanoid/breakout type game, Trix - a Qix type clone.
FD17: Educational Games - This disk includes several games for the younger members including geography, math, science, and word games, also includes Wheel of Fortune.
FD20: Tactical Games - MechForce(3.72); A game that simulates combat between two or more giant, robot-like machines. Simple words can't begin to give you the feel of piloting a 30 - 40 foot tall, fire breathing, earth shaking colossus that obeys your every whim.
FD26:Arcade Games - Marble_slide, this is a truly commercial quality game. Similar to a Lucas game named PipeDreams, excellent playability and entertainment, Mutants , a small version of the arcade game of the same name, also SuperBreakout a pong/arkanoids type game.
FD27: Arcade Games - This disk is loaded with some great games. Includes, Raceorama a great racing car game with ten different courses, MiniBlast a helicopter gunship type clone, Shark in the same class as froger, and SBreakout the original breakout with more.
FD29: Shoot'em up's - WWII - you're the pilot of a WWII plane flying through enemy territory, you've just been spotted, good luck on you mission, SpKiller - try and penetrate enemy lines with this game, and Retaliator - another great game.
FD31: Games! - Air Traffic Control - a good ATC simulation game, Black Jack Lab - a full featured set of card games, ChessTel - play chess with your friend in distant and remote places with this game and a modem, labyrnth - a well done text adventure game (like an infocom game), and MouseTrap - a 3d maze game.
FD32:Flight Simulator - Includes an instrument flight simulator for a DC10.
FD33: Arcade Games - Ffreddy a mario brothers type of game, Gerbils a target practice game, PipeLine a German interpretation of Pipe Dreams, Tron a light cycles version, and wetroids a wonderful version of asteroids with a hilarious twist.
FD35 Omega (v 1.3) - A new outstanding dungeon and outdoors adventure game in a similar vein as hack, rouge, and moria. This version is considerably faster and better that all previous versions. Play time several weeks or months.
FD37a & b:Tactical Games - Empire (2.2w) This great game comes highly recommended. With a full-graphic front end.
FD38:Games - Cribbage Master - A great cribbage game and tutor, Spades - a well done card came, ChineseCheckers - A computer version of this classic, Puzz - a slide piece puzzle game and construction set.
FD39a & b: Star Trek, The New Generation - This is a, completely different version of Star Trek than that found on FD12. This one was created by the German author Tobias. Now with English instructions. Excellent!!! Counts as two disks. Requires 512k memory.
FD44: Game - Mechfight is an out of this world role-playing adventure comparable to hack and moria. The setting, interplanetary colonies and space stations. In your quest to explore the world, take time out to liberate bad guys of their most valuable possessions, engage in a mortal combat or two against robots and alien life forms, pick up a new amiga 9000. Most of all, don't forget to stay alive...
FD49:Chaos Cheats - This disk contains an everything you wanted to know about cheat set for Chaos Strikes Back, including full maps, spells, object locations, super characters and more.
FD50: Submarine Game - Sealance, one and a half years in the making, this is an outstanding submarine tactical game. Commercial quality, highly recommended.
FD52: Classics Games - PetersQuest a well done Mario brothers type of game, Jymbc a two player missile command clone, and Vstank a tank commander game.
FD53: Great Arcade - On this disk is a wonderful implementation of the ever popular classic arcade game Defender. Also contain Air Race a WWII flying ace arcade game, and Psycoblast new creation idea game.
FD56: Arcade - Includes SpaceWar, HueyRaid a well done helicopter arcade game, and PowerPong a great expanded pong game.
FD57: Arcade Games - Includes 2 true commercial quality games. MegaBall is the successor to Ball; features 5 full musical scores, multiple levels and addicting gameplay. Gravity Attack is a psychadellic trip through several different worlds--each distinctly different.
FD58: GAMES! - Includes Steinschlag; a great Tetris clone from Germany with music. SCombat: simulate battle between up to 40 players & monsters. Imperium Romanum: Battle up to 4 players for control of the Mediterranean in this Risk-esque game.
FD59: Game Potpourri - Xenon III is an almost exact clone of the commercial game of the same name...a great shootemup. Crossword will take lists of words & automatically generate word-search puzzles for any Epson compatable printer.
FD60: Games - In Nebula, race over a 3d world to destroy enemy installations. Interferon; a great Dr. Mario clone. Enigma; is it a gameor a puzzle?
FD61: Games - Solitaire; great graphics, plays two versions. Klide; an interesting piece of eye candy. Extreme Violence; 2 player kill or bekilled game. YATC; A Tetris clone with Artifical Intelligence. Genesis; create realistic 3d fractal worlds.
WB4:Telecommumnication - This disk contains several excellent pd communication programs designed to get you on line quickly and easily, Access (1.42) - A very nice ANSI term program based on Comm v1.34, but with the addition of transfer protocols, Comm (1.34) - Last version of one of the best public domain communications programs ever made on the Amiga, Handshake (2.12a) Handshake is a Full featured VT52/100/102/220
WB5 - Fonts #1- Several fonts (35) for the Amiga, also included are five PageStream fonts,and ShowFont - a font display program.
WB6: Video Fonts #2 - ShowFont(4.0) This program allows you to quickly and painlessly view all 256 characters in a typical font. Large AmigaDos system fonts (many up to 56pts).
WB7: Clip Art - This disk is loaded with black and white clip art. Art includes, trees, watches, tools, US and State maps, and more.
WB9:Icons - Truly a multitude of various types and kinds. Also includes IconMiester, IconLab, and others great utilities to help generate icons.
WB10:Virus Killers - The latest and best VirusX(4.0), Kv(2.1), and ZeroVirus III.
WB11: Business - Clerk(4.0), finally a full featured business accounting PD program for the small to medium company. Includes receivables, payables, end of month and uch more.
WB12: Disk Utilities - This great disk is loaded with wonderful utilities for everything including making disk labels, disk cataloging, disk optimizing, disk and file recovery archive and organizing, and all sorts of file manipulation. A must have!
WB13: Printer Drivers and Generator - over 70 different drivers, and if these don't do it, with PrtDrvGen you can make your own.
WB15: Business - This disk contains a spreadsheet, a database, a project/time management program and financial analysis (stocks).
WB16: Business - This disk contains an inventory manager, a loan analysis program, a great calendar/scheduler, a rolodex program, and pennywise a good "Cash Book" accounting for home or office.
WB18: Word/Text Processors - This disk contains the best editors. Includes,TextPlus (v2.2e) a full featured word processor, Dme(v1.35) a great programmers editor with strong macro features,TexED(v2.8) an enhanced Emacs type editor, and a spell checker.
WB20: General Interest - DiskSalv V1.42 a disk recovery program for all Amiga file systems, FixDisk V1.0 another file recovery program with features DiskSalv doesn't have, 3DLook gives a 3D appearance to your WorkBench, Clean V1.01 a program to de-fragment memory, Tracer - trace any part of an image.
WB22: Fonts #3 - Several more great fonts. These, like the other font disks work great with Dpaint and WYSIWYG word processors.
WB23: Graphics and Plotting - Plot (20b) a three dimensional mathematical function plotter. Can plot any user defined function, BezSurf2 - produce awesome pictures of objects one could turn on a lathe. Can also map iff image files onto any surface that it can draw. Now compatible with most 3D packages, and VScreen - makes a virtual screen anywhere, great for DTP .
WB25:Educational - On this disk are two programs that can generate maps of differing types, World Data Base uses the CIA's data base to generate detailed maps of any entered user global coordinates. Also Paradox a great demonstration of Albert Einstein General Theory of Relativity.
WB26: Disk Utilities #2 - MrBackup, KwickBackup - two well done utilities to help with harddisk and floppy disk backups, FileMast - a binary file editor, Labelprinter - Disk label printer with very powerful features.
WB27: Nagel - 26 Patrick Nagel pictures of beautiful women.
WB29: Graphics and Sound - This disk has several different Mandelbrot type programs for generating stunning graphics. Includes, MandelMountains - a realistic terrain generator, Fracgen - generated recursive fractals from user input, Mandelbrot and Tmandel - two fast mandelbrot generators, also Mostra - the best IFF display program to date, will display ALL IFF's including Dynamic HAM, and Sound - a great IFF sound player, will play anything. Try this disk!
WB33:Circuit Board Design - several terrific routines for the

electronic enthusiast, Including PCBtool - a circuit board design tool, LogicLab - circuit logic tester, and Mcad (1.26) a well done new release of this PD CAD program, now comes with predrawn common circuit components for insertion into schematics.
WB34: Utilities - Several well done utilities, some will require moderate knowledge of a CLI or Shell for setup, Chatter Box - this one will play any user defined sound after any event (ie. disk insert, mouse click, disk removal...), , Artm - The Amiga real time monitor, gives you full control of the Amiga OS, very powerful program, Helper - help program to make learning the CLI easier, and more!
WB35: 3d Graphics - This disk contains several neat programs to use with your 3d modeling/raytracing programs 3dFonts - Full vector font set for use with 3d programs, FontMaker - make 3d fonts from any system font, Make3DShape - create 3d shapes from any image, DumptoIFF - create 3d animations preserves pallet, and World3d - a demo program of a front end for use with DKBRender.
WB36: Graphics - On this disk are several programs to create stunning graphical images including, MPath - creates swirling galaxy images, Roses - produce an unlimited number of variations of images that a symmetrically similar to a rose, SimGen - display those spectacular images as part of your workbenck screen, and RayShade - a very good raytracing program, create your own beautiful 3d graphic models with this one!
WB37: Educational - Educational games and puzzles that cover math, geography, spelling, and books. Ages 6 - 15
WB38: Plotting and Graphics - Plotxy is the most powerful full featured plotting package. Used by many colleges and universities. A welcome addition to our library! Highly recommended. Plans - a incredibly well done Computer Aided Drafting program, very full featured. Tesselator - a program that helps generates fantastic looking, recursive M.C. Ecsher type pictures.
WB39: Music - Intuitracker is a German offering of an exquisitely well done program that allows you to play music on your Amiga with CD like controls. Lets you strip out music from your favorite games or others and include them in your music library.
WB40: Music - "CD on a disk", 90 minutes of modern music on this well presented collection. Requires 2 drives or HD.
WB41: Music - MED an incredibly well done, full featured music editor. Create your own stunning music directly on your the Amiga. Similar to SoundTracker but better. Very powerful easy to use program. Ver. 3.10.
WB43:Business - This disk contains AnalytiCalc - probably the most powerful spreadsheet program on the Amiga. A full featured spreadsheet with many features expected in a commercial package. Requires 1.2 MB of memory!
WB46:Clip Art - HighRes clip art with the following motifs - embellishments (borders, dodads ,...), people, and transportation.
WB48: Clip Art - HighRes clip art with the following motifs - Holidays, music, medical, and misc.
WB49abc:Animation Sampler - On this three disk sampler set (counts as two disks) are some of the best animations that have been created over the last three years. Several examples of "Movie" type animations some with spectacular raytraced reality (coolroby, watch, spigot and egg). Also several european style or "Demo" animation with incredible graphics and outstanding electronic music (akrilight, copersine, doc, dps2010, impact, and logodemo). These truly show off the creative edge of an Amiga!

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WB50: Animation - Seven of the best european style animations or "Demos", including - scientific 451, subway (a U.S. entrant, also our favorite), sunride, thrstdemo, tnight, waves, and woow.
WB53:Graphics - Raytracing programs generate absolutely stunning realistic looking planes, rockets, buildings..., and surreal images often consisting of highly polished spheres and objects. C-Light is the most powerful EASY-TO-USE of it's kind we have seen to date. This is easily better, and more full featured, than similar commercial programs costing in the hundreds of dollars. Also, sMovie - a full featured video text titler similar to ProVideo, Broadcast Titler. Great video scrolling, wipes, special effects, and more...
WB54:Printing - This disk contains several routines to help with the chore of printing. Includes Gothic - Finally a Banner printer for the PD! PrintStudio -a well implemented all-purpose printer-utility with a very comfortable graphic interface and many advanced features, Lila - with ease, print ASCII files to a PostScript printer, and many more.
WB55:Application - XCopyIII - a full featured disk copier, make backups of write protected disks. RoadRoute - find the quickest route from one city to another, highway description included, Diary - a diary program like "Dougy Howard M.D", Cal - a calendar program, Magman - a database tailored to maintain records on articles and publications.
WB57:Animation - This disk has several "Demo" style animations, Including, Blitter, Lolly, Sun5, vertigo, vortex, and xenmorph.
WB59:Business - contains a great, very full featured stock market technical analysis and tracking program, also an appointment calendar, and more.
WB61:Intermediate Utilities - Includes programs to help to drasticaly decrease flicker in interlace and hi-res modes (antiflick), an Atari-st emulator, an eprom programmer, turn your amiga into an eight channel digital data analyzer or ocilloscope, and more.
WB62:Midi Utilities - Several useful midi utilities including, programs to transfer to and from several music programs to midi, a midi sysex handler, a midi recorder with timebase, display midi info, file sequence player, and a few scores.
WB63:Disk Utilities #3 - Several highly recommended programs to aid in removing duplicate files from your hard drive, performing file backups, Binary editing, fast formatting, file recovery, disk track recovery, and forced DISK VALIDATION of corrupt disks.
WB66:Icons #2- Lot's of neat icons. Also, several wonderful programs that to let you create your own icons, modify and manipulate icons and info structures.
WB68:Music Utilities - several good utilities for the Amiga music enthusiast. Includes, Noisetracker - a great music creation program, Sonix2MOD - converts sonix to .mod files which then can be used by noisetracker, soundtracker, and MED, SpeakerSim - a speaker design tool demo, Wondersound is an additive harmonic instrument design tool with a separate envelope design window and 16 relative harmonic strength and phase angle controls.
WB69: Music - This disk has over 90 minutes of classical and modern electronic music for you Amiga.

WB70:Desk Top Pub - Atcp - transfer Macintosh screen fonts, Mac or IBM format .AFM metric files, to Amiga screen fonts and PPage .metric files. With this program open door to the libraries of Adobe and PostScript type!, Calendar - month templates in PS form, Post - a full featured post script file display and print utility.
WB75: Music - over 100 instruments files (.inst) and sample sound files (.ss) for your music programs.
WB76: Applications - This disk contains Stichery - a often requested knitting design program, Lotto - a rather complete lottery tracking and prediction utility, SSS - this screen capture program can grab almost any screen including games, Today - a personal calender, Tarot - fortune teller, and Grammar - grammar checker.
WB78: AV - On this disk are two Amiga Vision programs (bubbler, sync) written by Lou Wallace, chief technical editor of Amiga World. These programs are marvelous examples of how too's with AV.
WB79: Home & Business Accounting - Includes Ckbacct - the most complete checkbook accounting program going, LCDCalc - this well done calculator has a very large display and operates from the keyboard or mouse, Mileage master - monitor your automobile mileage with this mileage log, Grammar - a grammar checker, and Worldtime - find out what time it is in up to 50 global cities.
WB81: Great Applications - DataEasy a very easy to use, database program. Don't let the ease of use fool you, this is a very full featured database program including full printer control for address labels and mail merge applications. Also includes, TypeTut a good typing tutor, RLC a full featured label printer, Banner, a multi-font banner maker, and Budget a home accounting in a program. Highly recommended.

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WB82:Animations - Four full length, well done "movie" style animations. Including, Coyote, Jugglerll, GhostPool, and Mechanix. Two disk set, counts as one!
WB83: Computer Art - this disk has some of the best Amiga generated computer art that we have collected in the past 5 years.
WB85: Graphics - Contains several programs for manipulating 24 Bit color images (ham-e) and a rather nice Iff Image processing package.
WB86: Amiga Vision - Contains the Centurion Press, An Amiga newspaper by Lou Wallace.
WB88abc: The Complete Bible - A three disk set, with the entire text of the New Testament and Old Testament. Great search utilities. Three disk set, counts as three.
WB90: Rippers, Strippers and Beats - For the Amiga music enthusiast, this disk contains many programs designed strip music from your favorite games and programs. Music can then be played with your favorite Pd Music program. Also contains Drums, a very nice drum machine. This disk can require moderate knowledge of the CLI.
DD45: AREXX Programs - This disk contains several useful arexx programs and examples, PopCLI4 - The latest of a must have utility.
DD47: Pascal - This disk contains everything needed to program in Pascal. Includes, A68k (1.2) 68000 assembler, Blink linking software and PCQ (1.0) a modest Pascal sub-set compiler.
DD49: C Compiler - contains zc(1.01) fully K&R, zcc(1.0) front end, A68k(1.2) assembler, Blink linker.
DD50: ARexx #2 - a must have set of tutorials on ARexx and several useful examples and utilities for ARexx development.
DD51: Circuit Analysis - Aspice (2.3) A full featured program for electric circuit analysis.
DD52: Scientific - Includes Elements - an incredibly well done periodic table program with source, Scientific plotting - over 600k of Lattice C source routines that can be included in your own programs.
DD54: Compression - This disk is loaded with all of the best file compression programs and aids for the Amiga. Many of the programs can be used by the new user. Includes Arc(2.3), Lharc(1.0), Lhwarp(1.03), Pkax(1.0), PowerPacker(2.3a) a must have by all, Zip(1.0), Warp(2.04), and Zoo(2.0). Also IFFcrunch an excellent compression for IFF files.
DD55: ARP - On this disk you will find the complete ArpRel3.0

AmigaDOS 2 Release

It's Here! It's Here!
Release 2.04 of AmigaDOS for the A500/A2000!!! Includes ROMS, disks and full-documentation. Requires installation.
$95.00

WB105A&B: Workbench 2.0 Extras #2
This set contains the programs that should have been included with WB 2.0. These powerful utilities take full advantage of the *many* new capabilities that are available in Workbench 2.0
Tool Manager - a *"wonderful"* utility to add programs to your TOOL menu, create a collection of icons on the workbench to easily launch frequently used programs...and much, much more! A true must have utility!!!--ALL of our Amigas rely *heavily* on this utility.
Icon - Enhances Workbench's "Show All" to display over 40 distinct icons for different types of files (text, graphic, source files, sound samples, libraries, etc., etc.)
Font Editor - Create/edit bitmap fonts with full color support!
Screen Blankers - ala fractals and spliners! No more boring black screen. Colorful, interesting and highly hypnotic effects!
Requester Enhancers - no more stale 'please insert volume' requesters--these are animated requesters for *all* of the system's requesters.
CPUBlit - speeds up text displays for owners of 68020+ CPUs.
Wallpaper - put workbench on top of any IFF picture!
SafeReboot - adds a safe way to reboot your computer...can *greatly* reduce disk validation errors!
SysInfo - see what's under the hood of your Amiga and see how fast they are.
Public Screen Utils - allow several separate programs to share the same screen.
Two disk set, counts as two disks.

release including the full user docs, the full Developers guide. ARP is the official AmigaDOS Resource Project (ARP) release 1.3. ARP makes many improvements to AmigaDOS and makes your system easier to use from the CLI.
DD57: Advanced Utilities - Msh - like Cross-dos, copies files to and from MS-DOS, Pal-NTSC - convert any pal program to NTSC and vice versa, Also several utilities that improve your startup-sequence, plus 25 more programs.
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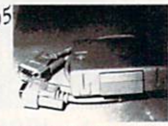


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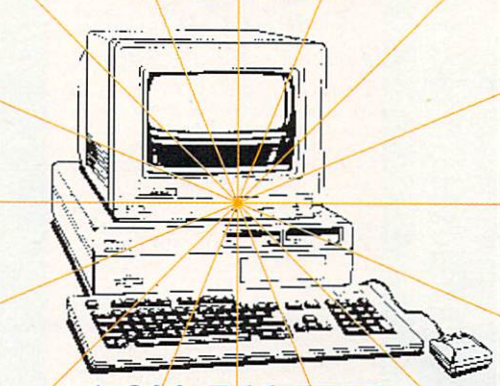
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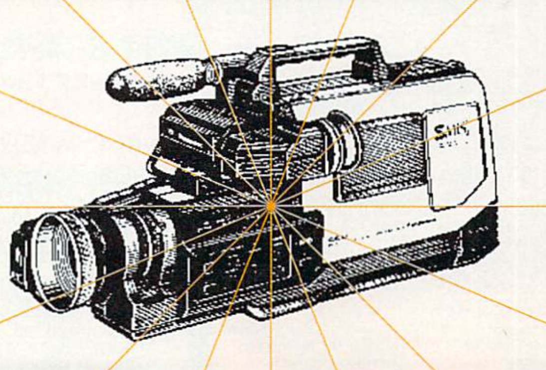
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CDTV Titles (call for pricing)

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Fusion-Forty

RCS Management's Motorola MC68040 accelerator board for the Amiga. With a clock speed of 28MHz the **Fusion-Forty** boasts incredible processing power of 18-25 MIPS and 3.5-8.0 MFLOPS.

Features include:
- ❑ 4MB of 32-bit RAM, expandable to 32MB
- ❑ Hardware select switch to disable accelerator
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- ❑ 6-layer board with separate power and ground planes to minimize noise

Briwall Price -- $1749

Mega-Midget Racer

The upgradable alternative from CSA

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- ▲20-33MHz 68030 using the same board
- ▲20-50MHz 68881/2 using the same board
- ▲Up to 8MB of 32-bit RAM (while maintaining all 9MB of your existing system RAM!)
- ▲Up to 2MB of fast, static 32-bit RAM (for the ROM Kernal, and super-fast screen updates.)

Mega-Midget Racer runs in the A500, A2000 and A1000 (call on the A1000), and is compatible with the Toaster, DTP programs, ray-tracing packages, and all other 68030-compatible software.

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All feature; 2 year warranty, easy user-replaceable printhead top, rear & Bottom feed, paper park & load multiple built-in fonts, easy-to-use LCD control panel

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BODEGA BAY

Your A500 can now be A2000 compatible. Add 4 A2000 slots, (3 are also PC slots), 3 Drive Bays a 200W Power Supply and more. Imagine putting all those little boxes into one A2000 type box. And we have the packages to meet your needs.

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Roctec RocHard

External hard drive system for the Amiga 500

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The Last Word

Kudos, complaints, comments, concerns, and contributions from our readers.

CDTV Impressions From the Far East

I've just installed a Commodore CDTV and am very impressed with it. However, I have a couple of queries and comments. No manual came with the machine, but one is absolutely essential. It's ridiculous to say that anything you want to know is on the instruction disk—one can't change disks and wait five minutes for a piece of information one could get instantly from the pages of a manual!

I imagine that several authors are rushing out books on this new machine. Have any been published yet? I don't yet have a keyboard... I hope that someone is developing a "palmtop" version incorporating all the essential functions.

Actually, I have not had much time to play with the CDTV because I've been diverted to my A3000 by the Vista program, which was featured in your September issue. It really is a fantastic program.

Arthur C. Clarke
Columbo, Sri Lanka

WordPerfect, We Need You

In a recent telephone conversation with a WordPerfect representative, I learned that version 5.01 for the Amiga is currently on the back burner during development of "WordPerfect for Windows." (I can't blame them for trying to improve their PC market potential.) The bottom line is that if Amiga users are serious about getting v5.01 back into development, they'll have to start a letter-writing campaign to show their support and need. Address your letters to: WordPerfect Corporate Communications, Attention Liz Tanner, 1555 Technology Way, Orem, UT 84057; FAX: (801)-222-2577.

John Comerford
Woodland Hills, Calif.

Pretty Knitting Patterns

In reference to your Sept. '91 editorial, one feature users said they wanted was sewing and knitting patterns on disk. Suzan Lazear of Encinitas, California, has done a remarkable amount of work in this field. She has a wonderful pattern program and also sells hardware and back-up software that does a fantastic job of interfacing with standard computerized knitting machines. Her address: Cochenille Computer Knit Products, PO Box 4276, Encinitas, CA 92024; (619)-942-1957.

William Adams
Seattle, Wash.

Many people with invisible handicaps could earn by using computers at home.

Empowering the Housebound

Thank you for your fine editorial (Dec. '91) regarding people with handicaps and the need to adapt personal computers so more such people could become gainfully employed. While your emphasis was on those with recognizable physical limitations, many people with invisible handicaps could earn by using computers at home. While they may not require special equipment, they do need the understanding of business people that they are capable of performing the same tasks with the same degree of skill as they would in an office miles away.

I am one of those. I am agoraphobic with post-polio weakness, which, combined, make it essentially impossible for me to work outside my home. About three years ago, I started my own desktop-publishing business with an Amiga 2000 system. Although my earnings are still modest, they have steadily increased, and I feel the venture is successful. Taking a cue from Joseph Campbell, I am following my bliss and loving every minute of it.

Educating the community is essential, and you have performed a vital service by calling attention to the fact that computers can be used to put house-bound people to work, give them an income, and let them become or resume being contributing members of society.

(Ms.) M.J. Barnes
Houston, Texas

The Working Amiga

Hats off to Jason Ivy (The Last Word, Oct. '91) for speaking out and demanding the recognition due the Amiga. I work for a Chicago UHF TV station that was the first one around and the first to commit itself to the Amiga, which we have been using for about five years. I understand that some local cable stations now use it, and the University of Illinois Circle recently purchased the Video Toaster for its new TV studios.

We use the Amiga for everything: newspaper ads, magazine covers, folders, tickets, brochures, sales presentations, posters, billboards, bus ads, invitations, multimedia presentations, 2-D and 3-D animation, news graphics, commercials, telethons, and even the live ticker on our stock-market show! The Amiga has saved the station a lot. Printers and output services continue to be amazed at what "that little machine can do." The networks are amazed at its graphics and secretly love it.

L. Jaime
Chicago, Ill.

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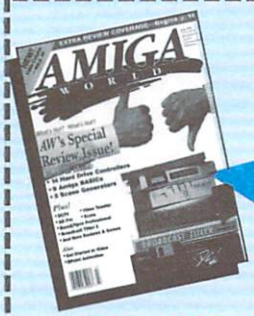
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a. ☐ Amiga 500　d. ☐ Amiga 2500
b. ☐ Amiga 1000　e. ☐ Amiga 3000
c. ☐ Amiga 2000　f. ☐ Don't own an Amiga

2. Hypothetically, if *AmigaWorld* could provide coverage of only 6 of these subjects every month, which 6 would you choose?

g. ☐ Business/accounting
h. ☐ Database management
i. ☐ Desktop publishing
j. ☐ Education
k. ☐ Games/entertainment
l. ☐ 2-D graphics/animation
m. ☐ 3-D graphics/animation
n. ☐ Home productivity and finance
o. ☐ IBM/Mac emulation/conversion
p. ☐ Multimedia production/presentation
q. ☐ Music/sound
r. ☐ Operating system software
s. ☐ Programming
t. ☐ Science/engineering (CAD, Unix, etc.)
u. ☐ System upgrade/expansion (hardware)
v. ☐ Telecommunications
w. ☐ Video
x. ☐ Word processing

3. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find most valuable?

y. ☐ Accent on Graphics　4. ☐ Help Key
z. ☐ Back Talk　5. ☐ The Last Word
1. ☐ Chief Concerns　6. ☐ Overscan
2. ☐ Crib Notes　7. ☐ Reviews (General)
3. ☐ Game Reviews　8. ☐ Video Suite

4. Which 4 regular monthly sections (not articles) of *AmigaWorld* do you find least valuable?

9. ☐ Accent on Graphics　e. ☐ Help Key
a. ☐ Back Talk　f. ☐ The Last Word
b. ☐ Chief Concerns　g. ☐ Overscan
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Valid Until
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1	26	51	76	101	126	151	176
2	27	52	77	102	127	152	177
3	28	53	78	103	128	153	178
4	29	54	79	104	129	154	179
5	30	55	80	105	130	155	180
6	31	56	81	106	131	156	181
7	32	57	82	107	132	157	182
8	33	58	83	108	133	158	183
9	34	59	84	109	134	159	184
10	35	60	85	110	135	160	185
11	36	61	86	111	136	161	186
12	37	62	87	112	137	162	187
13	38	63	88	113	138	163	188
14	39	64	89	114	139	164	189
15	40	65	90	115	140	165	190
16	41	66	91	116	141	166	191
17	42	67	92	117	142	167	192
18	43	68	93	118	143	168	193
19	44	69	94	119	144	169	194
20	45	70	95	120	145	170	195
21	46	71	96	121	146	171	196
22	47	72	97	122	147	172	197
23	48	73	98	123	148	173	198
24	49	74	99	124	149	174	199
25	50	75	100	125	150	175	200

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t. ☐ Science/engineering (CAD, Unix, etc.)
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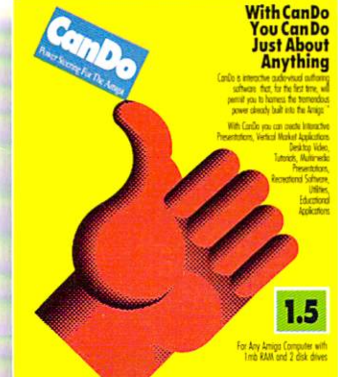
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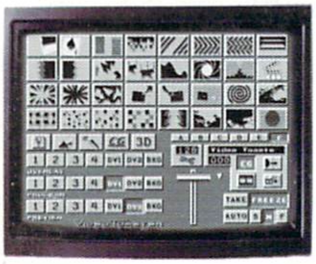
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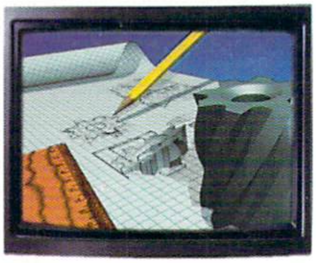
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